AMERICAN JOURNAL OF ORTHODONTICS

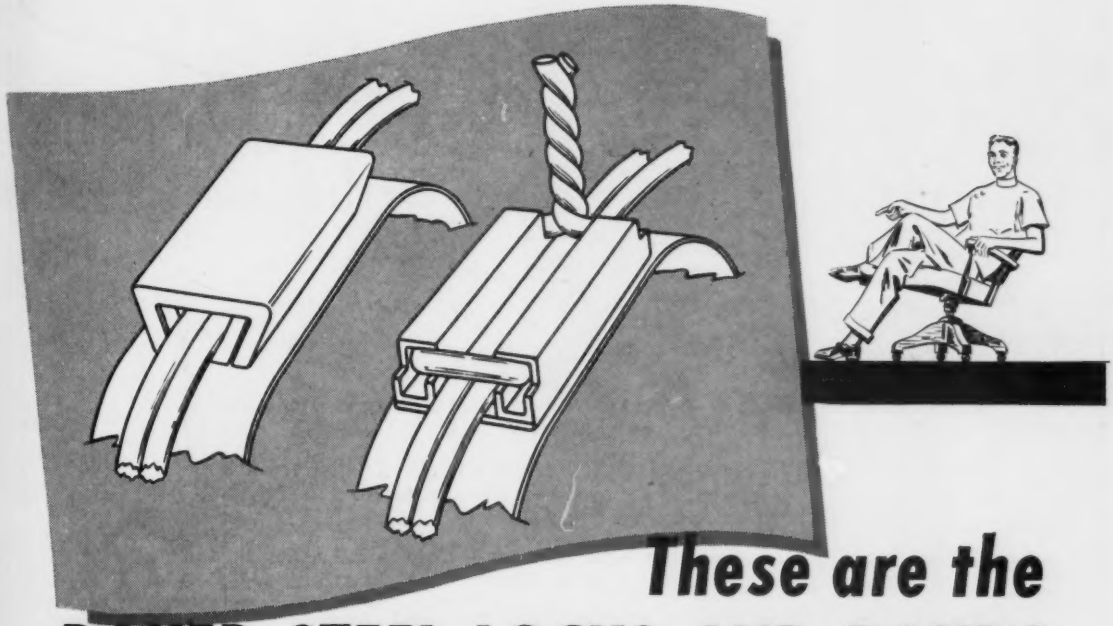
OFFICIAL PUBLICATION OF
THE AMERICAN ASSOCIATION OF ORTHODONTISTS,
ITS COMPONENT SOCIETIES, AND
THE AMERICAN BOARD OF ORTHODONTICS

PUBLISHED BY THE C. V. MOSBY COMPANY, ST. LOUIS 3, U. S. A.

TABLE OF CONTENTS ON PAGE 2

Vol. 43 AUGUST, 1957 No. 8

Vol. 43, No. 8, August, 1957. American Journal of Orthodontics is published monthly by The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, Mo. Subscription rates: United States and its Possessions $10.00, Students $5.00; Canada, Latin-America, and Spain $10.50, Students $5.50; Other Countries $11.00, Students $6.00. Single copies $1.75 postpaid. Entered as Second-class matter, January 14, 1915, at the Post Office at St. Louis, Missouri, under the Act of March 3, 1879. Printed in the U. S. A.



These are the BAKER STEEL LOCKS AND BANDS for the Johnson Twin Arch Technic

The new Baker tie brackets as well as the genuine Johnson locks for the twin arch technic are now also available in stainless steel.

All genuine Baker precious metal or steel caps will fit any genuine Johnson locks regardless of where your patients may go.

The Baker tie brackets are the same length as the Johnson locks. The ligature tightens over the end platforms leaving the arch to slide freely, avoiding any possibility of binding the arch to the tooth. They have a definite seat for the twin arch or the small Johnson ribbon arch, and will accept up to .022 x .028 edgewise wire perfectly.

Both are supplied mounted on the four sizes of .004 Johnson stainless steel pinch bands $\frac{3}{32}$″ or $\frac{1}{8}$″ widths, or on .003 or .004 gauge steel strip bands $\frac{3}{32}$″ or $\frac{1}{8}$″ wide, $1\frac{3}{4}$″ or 2″ lengths, or on welded loop and anterior bands.

★ ★ ★ ★ ★ ★ ★ ★

BAKER & CO., INC.

850 PASSAIC AVENUE • EAST NEWARK, NEW JERSEY

NEW YORK CITY 30 Church St. • **CHICAGO** 55 E. Washington Street • **SAN FRANCISCO** 760 Market Street

BAKER
THE WORLD'S LARGEST WORKERS AND REFINERS OF PRECIOUS METALS

CONTENTS FOR AUGUST, 1957

American Journal of Orthodontics

Original Articles

Editorials

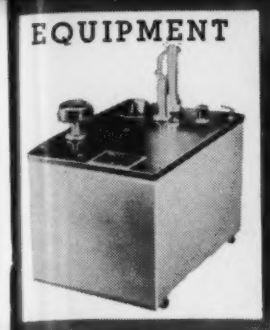
The Fifty-third Annual Meeting of the American Association of Orthodontists

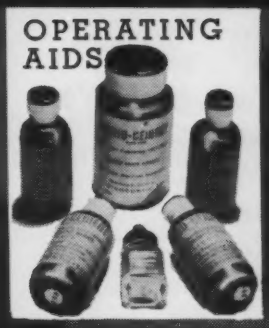
Department of Orthodontic Abstracts and Reviews

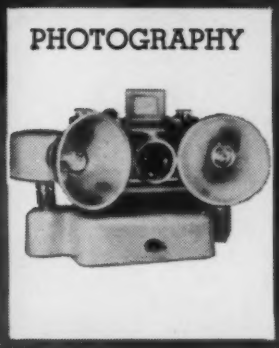
News and Notes

Officers of Orthodontic Societies

(Editorial and Business Communications on inside back cover)







5 Minutes!

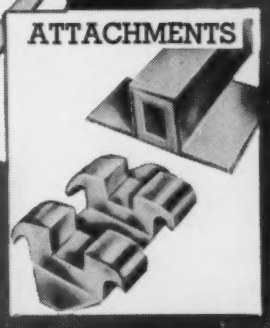
Dear Doctor:

Have you 5 minutes to look through the catalogue we sent you a few months ago? There are a number of items, exclusively ours, that will assist you in saving hours of "Chair Time."

New brackets—New attachments —New tubes — New materials — New pliers—New aids.

Cordially yours,

Betta Orthodontic Supplies



ETTA ORTHODONTIC SUPPLIES

3 WEST 64TH STREET • NEW YORK 23

IF IT'S ORTHODONTIC . . . WE HAVE IT''

BETTA ORTHODONTIC SUPPLIES

SINCE 1929

Orthodontist's Service

℞ by prescription only

ASK THE ORTHODONTISTS WE SERVE

Dear Doctor:

We can add more hours to your "chair time" day, if we process your retainers and bite plates.

Whether it is an acrylic Hawley Retainer or a Crozat type all-metal retainer, you may be certain it will go to place with a minimum of effort, thus increasing your "chair time" for other operative needs.

Air Mail Special Delivery delivers a finished appliance anywhere in the United States in time to meet your patient's appointment.

Sincerely
Orthodontist's Service

P.S. A postcard will bring our brochure "B."

To Your Rx

HAWLEY RETAINERS

Regulation Hawley
Flat Wire Hawley
Full Labial Hawley
Arrow Clasp Hawley
Expansion Screw Plate
Coffin Spring Retainer
Crozat Retainer
Johnson Retainer
Sillman Retainer
Sillman Splint
Jackson Retainer
Higley Split Plate
Skeletal Retainer

ACRYLIC BITE PLATES

Anterior Bite Plate
Acrylic Guide Plane
Northwestern Bite Plate
Posterior Bite Plate
Full Occlusal Splint
Lower Reverse Incline
Sved Bite Plate
Sved Distal Drive
Lingual Anchor Plate
Monoblock
Acrylic Chin Cap
Acrylic Mouth Shield

FIXED APPLIANCE DEPT.

Soldered Linguals
Removable Linguals
Space Maintainers
Swedged Bands
Molar—Cuspid
Extra-Oral Bows

—•—

Stainless Steel
or
Precious Metal

123 WEST 64th ST. • NEW YORK 23, N. Y. •• SUsquehanna 7-1418-9

SERVICES LIMITED TO ORTHODONTICS • "You Prescribe it. We make it"

A Prescription . . .

THAT

ASSURES

YOU

OF

THE

FINEST

SET-UP

AND

POSITIONER

pencil line, approximately
occlusion, extending from
that of t
es of the

☒ Trimmed the backs of the
when the teeth are in cent

☐ Enclosed a wax bite.

SET-UP

☐ Done by Orthodontist.

☒ To be done by T-P Labora

Re-position, closing spaces of:

☒ All the teeth.

☐ Teeth that are marked be
numbers that correspond t

87654321	12345
87654321	12345

Occlusal Plane:

☒ Leave approximately as is.

☐ Approximate Curve of Sp

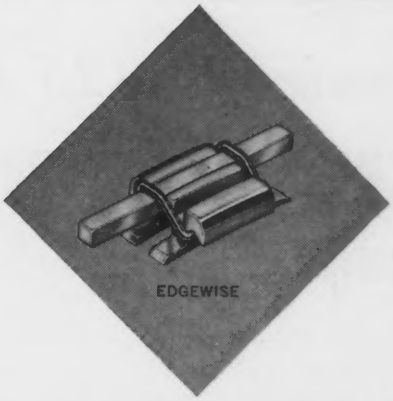
☐ Set to flat plane.

T-P LABORATORIES, Inc.

P. O. BOX 73

LA PORTE, INDIANA

Serving the Orthodontist



Now... combine the best advantages of three technics with

BOWLES MULTI-PHASE BRACKETS BY UNITEK

Multi-phase brackets give you your choice of 3 technics or various combinations of technics for special effects.

These new brackets simplify the job of changing treatment procedures by eliminating the need for removing bands or attaching cumbersome auxiliaries. Besides saving you time and effort, Bowles Multi-phase brackets permit you to use the technic or combination of technics you consider most efficient during any phase of treatment. Furthermore, they lessen the transfer patient problem by making it possible for you to change or continue treatment plans without interruption – and with less patient discomfort.

please write for complimentary professional samples

UNITEK

unitek corporation, 275 north halstead avenue, pasadena, california

ELGILOY

COIL SPRING

Elgiloy is the modern wonder metal of The Famous ELGIN DuraPower Watch Mainspring . . . "The heart that never breaks".

The performance of Elgiloy Orthodontic Coil Springs far surpassed others. Compare an Elgiloy Spring with another by stretching the two, one-half or double their original length. Notice the conventional spring will "give way," while the Elgiloy Spring will retain its original set longer. (The "stiffness" of Elgiloy Springs can be increased even more by heat-treating at 900° from 3 to 10 minutes.)

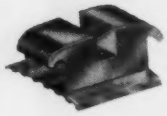
Try a length of Elgiloy Coil Spring furnished in the convenient R.M. Dispenser Spool. You will save time and increase the mechanical efficiency of your appliance.

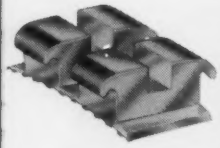
ROCKY MOUNTAIN METAL PRODUCTS CO.

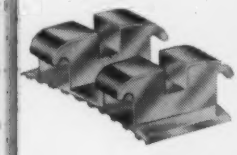
P.O. BOX 1887 • DENVER 1, COLORADO • U. S. A.

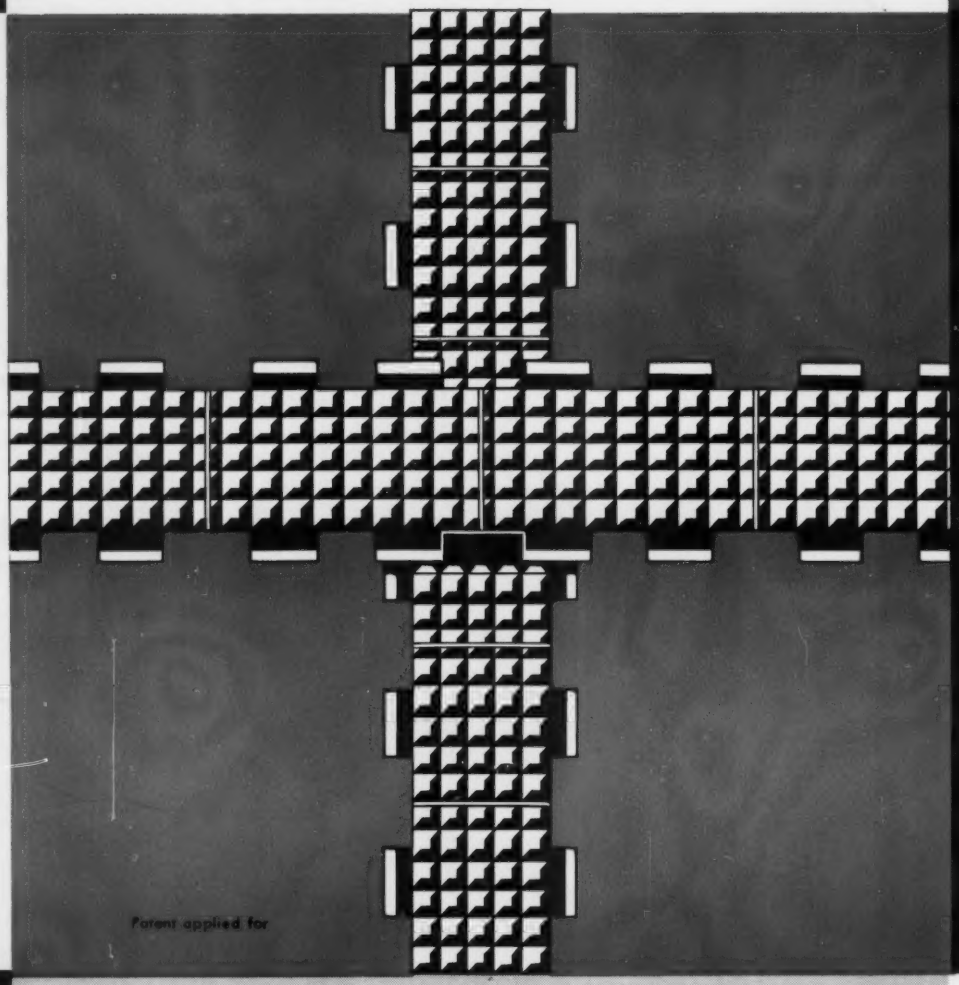
THE PIONEER AND LEADING MANUFACTURER OF CHROME ALLOYS FOR ORTHODONTICS AND DENTISTRY FOR CHILDREN

The New PLUS FACTOR in R. M. Edgewise Brackets









In addition to incorporating many precision refinements into the New R. M. Edgewise Brackets, Rocky Mountain engineering has added the unique projection welding feature. This new development will make your edgewise welding more effective.

There are a series of rows of tiny projections on the welding surface of all new R. M. Edgewise Brackets. These projections serve as small electrodes and help localize welding heat. As the welding current passes through the bracket, the projections beneath the electrode heat flatten, and blend into the surface of the band material. With R. M. Projection Welding you get a number of well-spaced, tiny welds each time. This makes for more uniform, secure spot welding.

You will like the New R. M. Edgewise Brackets—especially the new projection welding principle.

ROCKY MOUNTAIN METAL PRODUCTS CO.

NEW YORK • DENVER • SAN FRANCISCO

American Journal

of

ORTHODONTICS

VOL. 43 AUGUST, 1957 No. 8

Original Articles

ORTHODONTIC SIGNIFICANCE OF ANOMALIES OF TOOTH ERUPTION

ARTHUR S. ASH, B.S., D.D.S., MOUNT VERNON, N. Y.

INTRODUCTION

THE achievement of a normal occlusion is the result of so many interrelated variables that the occasional existence of this ideal would seem to defy the laws of probability. Hereditary and developmental, muscular, osseous, and dental, systemic and local, physical and emotional, and other factors and combinations of factors contributing to the establishment of the occlusion must operate within precise limits. The multiplicity and complexity of these factors are such that the wonder is not that malocclusion exists, but that occasionally there can be found a mouth with no orthodontic problem.

Among the contributing factors is that of the teeth themselves. Thirty-two or some lesser, or even greater, number of units, each with an individual developmental and eruptive pattern, must be correlated spatially and chronologically with the development of adjacent structures, or some degree of malocclusion will follow. "The movements of the teeth, during eruption, are intricate and are accomplished by minute co-ordination of growth of teeth, growth of the alveolar process, growth of the jaws. Any break in this correlation may affect the direction of the movements."[1]

This thesis, which was given as a partial fulfillment of the requirements for certification by the American Board of Orthodontics, is being published with the consent and recommendation of the Board, but it should be understood that it does not necessarily represent or express the opinion of the Board.

Unfortunately, breaks in this correlation do exist, resulting in anomalies of tooth eruption which initiate orthodontic problems or contribute to existing ones. It is the purpose of this article to consider two such eruptive anomalies and their significance in the total orthodontic picture.

An anomaly of tooth eruption may be spatial, in which instance a tooth erupts in an ectopic position, or it may be sequential, in which case there exists a disturbance in the order or time of eruption. Moreover, in many cases there are discrepancies in both position and time of eruption. It is recognized that these anomalies are not primary etiological factors of malocclusion, but rather that they are elements or symptoms of the malocclusion itself and may secondarily cause other orthodontic difficulties.

Orthodontic literature has recognized that anomalies of tooth eruption (and tooth formation) contribute to the difficulties of diagnosis and treatment. In general, those eruptive anomalies which occur sufficiently often to present a recurrent problem to the orthodontist have been well documented in the texts and the journals of the profession. In this group would be found the ectopic eruption, retarded eruption, or impaction of maxillary canines and third molars, as well as the difficulties attendant to transposed teeth and ankylosed or submerged teeth. In addition, case reports of extreme rarities find their way into orthodontic literature, if not by virtue of their general applicability, then because of their unusual nature. However, somewhere between the relatively frequent and the extremely rare lies the occasional—that anomaly of tooth eruption occurring too seldom to be commonplace, but often enough to be troublesome. Two such occasional anomalies of tooth eruption have proved recurrently troublesome to a sufficient degree to encourage my further investigation, and these will be specifically considered in this article.

MALPOSED OR RETARDED ERUPTION OF MAXILLARY PERMANENT CENTRAL INCISOR

On occasion the orthodontist called upon to examine a patient finds a maxillary permanent central incisor either malposed or retarded, or both, in its eruption, with no immediately apparent clinical explanation for the condition. The occlusion is very often satisfactory, or if a malocclusion is found, it is not of a type to force the tooth in question out of the dental arch. Perverted internal or external muscular pressures may be found associated with the situation, but only in rare instances can these forces be so circumscribed as to exert pressure on and malpose a single tooth.

When a more detailed investigation concerning the etiology of the condition is instituted, it is the frequent recurrence of a typical clinical history that sheds light upon its origin. Such a history presents a picture of a blow to a deciduous central incisor, possibly traumatic displacement of the tooth, subsequent discoloration (Fig. 1), devitalization, periapical infection or recurrent "gumboils," followed by extraction or by an attempt to maintain the tooth in the mouth with a minimum of discomfort. The eventual clinical termination of the cases seen was malposition of the underlying permanent incisor, probably with retarded eruption of the tooth. It has been said: "The two year old leans forward as he runs. Should he fall he would bruise his

forehead; at two and a half he will hit his nose; at three, his teeth."[2] It could well be added that, as a consequence, at 7 years of age he may show up in a dental office with a malposed permanent central incisor.

In a study of ectopic eruption in children in North Carolina, Byrd[3] found that it "occurred in approximately one out of three children between the ages of five and ten years," that it centered about the anterior part of both jaws, and that an additional classification, "ectopic eruption of the permanent central incisors," was warranted. As Table I indicates, thirty-seven such ectopically erupted or belatedly erupted maxillary permanent central incisors were studied in the preparation of one phase of this report.

Fig. 1.—Discoloration of maxillary deciduous left central incisor following traumatization.

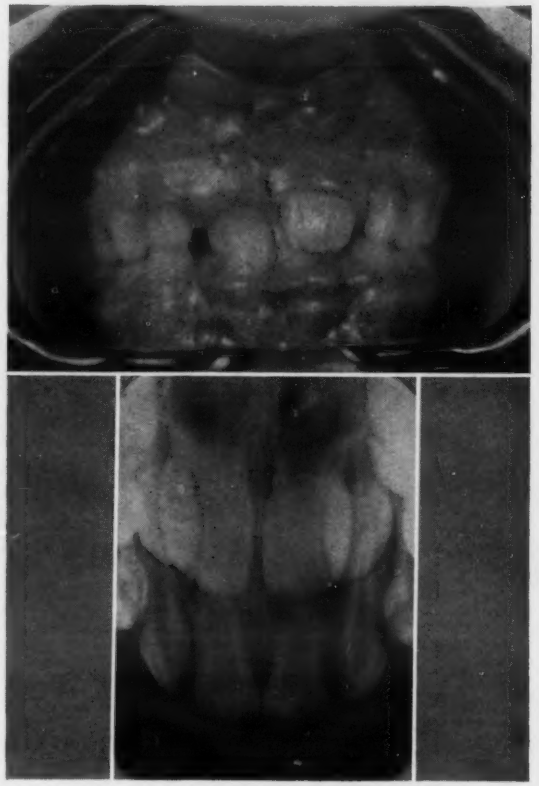
Table I shows concisely the observations made on these thirty-seven children. In every instance the presence of a malposed, retarded, or unerupted permanent central incisor was the condition that led to an orthodontic consultation. With five exceptions, the histories, as obtained from the parents, indicated that the malposition, retarded eruption of the tooth, or both had developed subsequent to the traumatization of the corresponding deciduous tooth. Data have been recorded as to the age at which the trauma occurred and the resultant symptoms with respect to displacement or discoloration of the deciduous tooth and abscess or fistula formation. If the deciduous tooth was subsequently extracted, the age of the child at the time of extraction was noted. For purposes of comparison, the time of eruption of the permanent central incisor replacing the adjacent nontraumatized deciduous tooth was considered normal for the individual patient concerned, and this was used as a guide in determining the degree of retardation of eruption of the affected tooth. Variations of position of eruption of the affected teeth were recorded as labial (Fig. 2), lingual (Fig. 3), and in proper labiolingual alignment (Fig. 4).

A.

B. C.

Fig. 2.

A.



B.

Fig. 3.

Fig. 2.—Intraoral and roentgenographic appearance of labially displaced maxillary permanent right central incisor following traumatization and devitalization of corresponding deciduous tooth.

Fig. 3.—*A*, Intraoral appearance of lingually displaced maxillary permanent right central incisor following traumatization and devitalization of corresponding deciduous tooth. Scar at site of previous opening of fistulous tract is still evident. *B*, Earlier roentgenogram showing nonresorption of the nonvital deciduous root.

To summarize Table I, it was found that thirty-two patients had presented some history of previous deciduous tooth traumatization, and that the five with no such history went on to similar devitalization. Eleven teeth had been displaced by the trauma, twenty-eight had eventually discolored to a noticeable extent, and thirty had gone on to eventual abscess and fistula formation. Twenty-three of the affected permanent teeth had erupted three or more

TABLE 1

NO.	AGE AT WHICH DECIDUOUS TOOTH TRAUMA OCCURRED	SYMPTOMS			AGE AT TIME OF EXTRACTION	AGE AT ERUPTION OF NORMAL INCISOR	AGE AT ERUPTION OF AFFECTED INCISOR	ALIGNMENT
1	3 yr. 6 mo.	D	C	F	5 yr. 6 mo.	7 yr. 1 mo.	7 yr. 10 mo.	Labial
2	4 yr. 6 mo.	D	C	F	7 yr.	6 yr. 10 mo.	6 yr. 11 mo.	Lingual
3	4 yr.		C	F	5 yr. 6 mo.	6 yr. 10 mo.	7 yr. 6 mo.	Labial
4	2 yr.		C	F	7 yr. 3 mo.	6 yr. 8 mo.	7 yr. 5 mo.	Lingual
5	2 yr. 6 mo.			F	No	7 yr.	7 yr. 2 mo.	Lingual
6	None		C	F	5 yr.	6 yr. 7 mo.	6 yr. 10 mo.	Labial
7	4 yr. 6 mo.		C		6 yr. 4 mo.	6 yr. 1 mo.	6 yr. 4 mo.	Lingual
8	3 yr. 6 mo.	D	C		6 yr.	6 yr. 5 mo.	6 yr. 11 mo.	Labial
9	4 yr.		C	F	5 yr. 8 mo.	6 yr. 10 mo.	7 yr. 1 mo.	Labial
10	3 yr. 3 mo.			F	7 yr. 4 mo.	7 yr. 2 mo.	7 yr. 4 mo.	Lingual
11	4 yr. 6 mo.		C	F	No	7 yr.	7 yr. 4 mo.	Labial
12	4 yr. 4 mo.		C	F	6 yr.	6 yr. 10 mo.	7 yr. 3 mo.	Normal
13	2 yr. 6 mo.		C	F	4 yr. 6 mo.	6 yr. 9 mo.	7 yr. 1 mo.	Labial
14	None			F	5 yr. 6 mo.	7 yr. 2 mo.	7 yr. 7 mo.	Labial
15	4 yr.		C	F	5 yr.	6 yr. 8 mo.	7 yr. 2 mo.	Labial
16	None	D	C	F	4 yr. 5 mo.	7 yr. 2 mo.	8 yr.	Labial
17	3 yr.	D	C	F	6 yr. 8 mo.	6 yr. 7 mo.	6 yr. 8 mo.	Lingual
18	4 yr.		C	F	7 yr. 2 mo.	6 yr. 10 mo.	7 yr. 2 mo.	Lingual
19	3 yr.	D	C		6 yr. 10 mo.	6 yr. 10 mo.	6 yr. 11 mo.	Lingual
20	5 yr. 2 mo.		C	F	6 yr.	7 yr.	7 yr. 1 mo.	Labial
21	4 yr.			F	4 yr. 10 mo.	6 yr. 3 mo.	6 yr. 6 mo.	Labial
22	3 yr. 6 mo.		C	F	No	7 yr. 1 mo.	7 yr. 4 mo.	Lingual
23	5 yr. 6 mo.		C		6 yr.	7 yr. 2 mo.	7 yr. 6 mo.	Labial
24	None		C	F	7 yr. 1 mo.	7 yr.	7 yr. 3 mo.	Lingual
25	3 yr. 6 mo.		C	F	6 yr. 8 mo.	6 yr. 6 mo.	6 yr. 9 mo.	Lingual
26	4 yr.	D			6 yr. 10 mo.	6 yr. 10 mo.	6 yr. 10 mo.	Lingual
27	4 yr. 6 mo.	D	C		No	6 yr. 5 mo.	6 yr. 11 mo.	Labial
28	3 yr.			F	No	7 yr.	7 yr. 7 mo.	Normal
29	3 yr. 6 mo.			F	5 yr.	6 yr. 6 mo.	6 yr. 10 mo.	Labial
30	5 yr.	D	C	F	5 yr. 4 mo.	6 yr. 8 mo.	6 yr. 9 mo.	Labial
31	4 yr.	D	C	F	7 yr.	6 yr. 9 mo.	6 yr. 11 mo.	Lingual
32	None			F	5 yr. 9 mo.	7 yr.	7 yr.	Labial
33	3 yr. 6 mo.		C	F	No	7 yr. 1 mo.	7 yr. 3 mo.	Lingual
34	3 yr. 6 mo.			F	6 yr.	6 yr. 6 mo.	6 yr. 10 mo.	Labial
35	4 yr.		C	F	7 yr. 1 mo.	7 yr. 1 mo.	NYE	
36	4 yr.		C		6 yr.	7 yr. 1 mo.	7 yr.	Labial
37	2 yr. 6 mo.	D	C	F	4 yr. 6 mo.	7 yr.	NYE	

D = Displaced.
C = Discolored.
F = Fistula.
NYE = Not yet erupted.

months after the normal eruption time, twelve had erupted within three months of the normal eruption time, and two teeth had not yet erupted at the time of preparation of this report. Nineteen teeth had erupted labially, fourteen lingually, and two in normal labiolingual alignment.

Admittedly, these findings are subject to several qualifications. Primarily, it is recognized that there may have been untold instances of traumatized deciduous central incisors with essentially similar later symptoms, except that their exfoliation was normal as was the eruption of the corresponding permanent teeth. Such cases, with no "clinical termination," as mentioned above, rarely find their way to an orthodontist's office, certainly not

A. *B.* *C.*

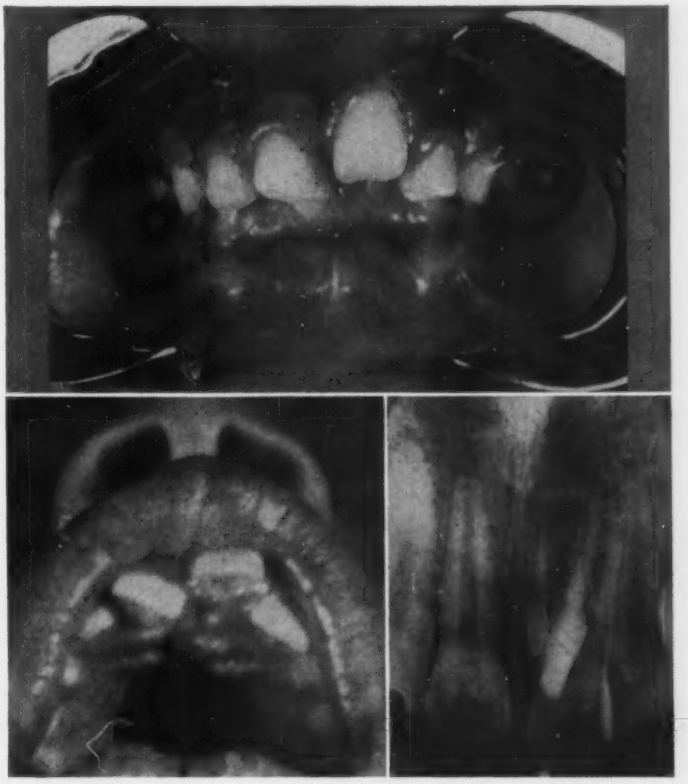
Fig. 4.—Intraoral and roentgenographic appearance of maxillary permanent right central incisor retarded in eruption following traumatization and devitalization of corresponding deciduous tooth.

for the specific reason with which we are concerned here. Moreover, there is the fact that practically all the information was obtained from the patients' parents, a source obviously subject to inaccuracies. For these reasons, there has been no attempt to attach any claims of statistical significance to the data. However, it is felt that the clinical findings were so consistent as to be of definite clinical significance, and the cause-and-effect relationship was deemed worthy of further study.

Devitalization of a deciduous tooth has often been cited as a cause of malocclusion, in many instances with no further explanation and no mention of the physiologic or pathologic mechanisms involved. On the whole, it is

evident that the clinical picture is one of obstruction, similar in many respects to the situation prevailing in the presence of a supernumerary tooth (Fig. 5). In analyzing the thirty-seven cases under consideration here, the variations in management of the nonvital deciduous teeth offer a consistent explanation of the etiology of the malposition and retarded eruption of the permanent successors.

A.



B. *C.*

Fig. 5.—Intraoral and roentgenographic appearance of malposed maxillary permanent left central incisor in presence of supernumerary tooth.

In the fourteen instances in which the permanent tooth erupted lingually, the nonvital deciduous tooth (1) had been retained up to or beyond the point of permanent tooth eruption and then extracted in seven cases, (2) had been extracted two months or less prior to permanent tooth eruption in four cases, and (3) had been lost at the time of permanent tooth eruption in three cases. In all fourteen cases there had been no early extraction of the nonvital deciduous tooth, despite discernible clinical evidence and history of its loss of vitality. This prolonged retention of the nonvital deciduous tooth, generally with a radiographically evident nonresorbing root, was the factor causing lingual eruption of the permanent tooth.

Anderson[4] has attributed this lingual eruption to reduced resorptivity of the nonvital deciduous tooth. He states: "The normal calcifying position of the maxillary incisor is lingual to the root of the deciduous incisor. In the

natural course of events the permanent incisor moves down and forward as eruption progresses, but its proper positioning depends upon the normal root decalcification of the deciduous tooth. Failure to decalcify or any considerable slowness in decalcification means interference to this very necessary forward as well as downward movement of the permanent tooth. Such interference may result in eventual lingual maxillary permanent incisor eruption."

In the nineteen instances in which the permanent tooth erupted labially, the nonvital deciduous tooth (1) had been extracted at least one year previously in fifteen cases, (2) had been extracted ten and eleven months previously in two cases, and (3) had been lost spontaneously in two cases. In these instances the early extraction of the deciduous tooth had removed a natural obstacle to the forward movement of the permanent tooth, explaining its subsequent ectopic eruption.

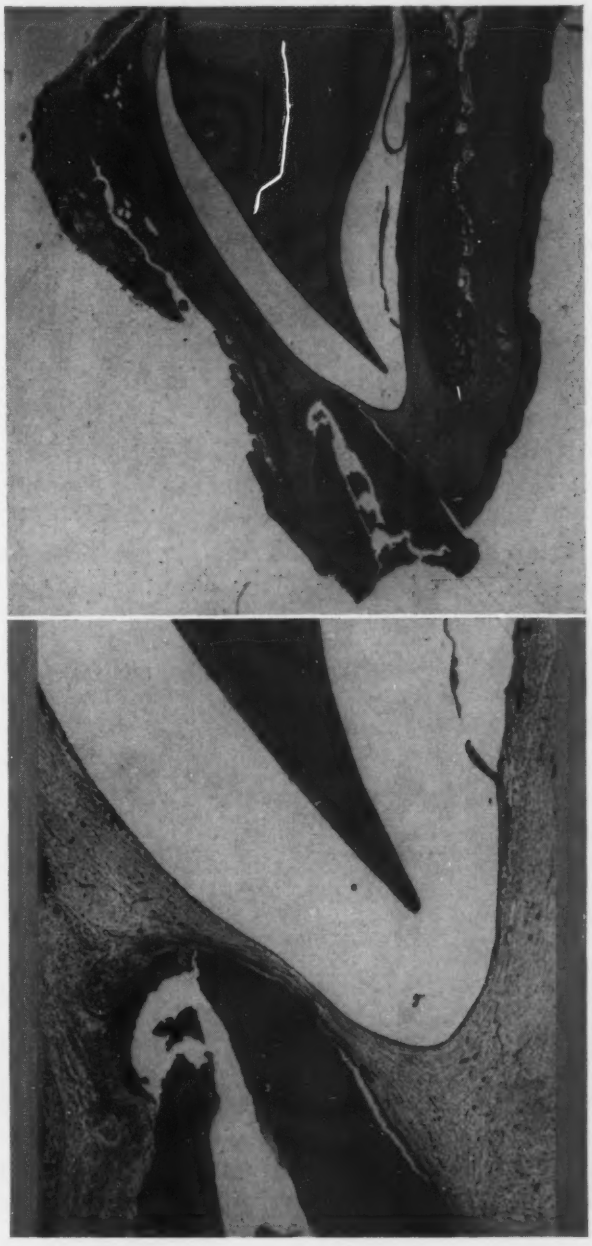
Fig. 6.—Intraoral roentgenogram showing premature root resorption of maxillary deciduous central incisor on the right following traumatization of the tooth.

Where the two deciduous teeth apparently had been shed normally and yet were followed by labial displacement of the permanent teeth, a possible explanation lies in the occurrence at times of spontaneous resorption of a traumatized deciduous tooth (Fig. 6), similar perhaps to that observed in the case of a traumatized permanent tooth.

In addition to the displacement of the permanent teeth, there was also the retardation of eruption observed in twenty-three cases. It would appear logical, and in fact has been stated, that "where an intense area of pathology appears at the roots of a deciduous tooth, the loss of osseous tissue is sometimes sufficient to cause the succeeding permanent tooth to erupt faster than the counterpart on the opposite side of the arch."[5] This appears to be the case where the extracted tooth overlies a permanent tooth nearly ready to erupt, but quite the opposite was found to be the situation in this series of cases; where the deciduous tooth had been extracted because of periapical infection, the eruption of the succeeding permanent tooth appeared to be slower than that of its counterpart.

A fibrous tissue formation, walling off the developing tooth bud from the infection around the deciduous tooth and subsequently forming a barrier to eruption, may be the explanation. It is one which histopathologic studies by Bauer[6] tend to confirm. Bauer's work was performed on autopsy material from children who died of bronchopneumonia and in whose mouths were

A.



B.

Fig. 7.—*A*, Labiolingual section through deciduous maxillary incisor with its successor. Periapical abscess of deciduous tooth in contact with united enamel-epithelium of bud. *B*, Higher magnification of *A*. United enamel-epithelium adjacent to abscess transformed into thin hyaline membrane. (From Bauer: AM. J. ORTHODONTICS & ORAL SURG., April, 1946.)

found abscessed, carious deciduous teeth. In one instance, Bauer's description of the resulting photomicrographs read: "Some lymphocytes and plasma cells were noted in the sac tissue, which exhibited an unusual fibrosis. A considerable fibrous wall bridged the wide gap in the bony crypt opposite the apices. This dense tissue must be regarded as the reaction to the adjacent injury."

In another case (Fig. 7) his description was as follows: "The palatal part of the alveolar process of the deciduous central incisor was missing, and a dense fibrous tissue replaced the bone beneath the gingival margin."

Similar autopsy material in instances where there has been traumatic, as opposed to carious, devitalization of deciduous teeth is not available, to my knowledge. However, there is no reason to assume that the histopathologic response to periapical infection induced traumatically should differ essentially from the response to infection as a result of caries. This fibrous tissue, similar to scar tissue, does not resorb in response to pressure, as does bone, and hence it represents a barrier to eruption.

Kjellgren[7] reported similar findings differently: "Very premature loss of a deciduous tooth several years before the normal eruption time of its successor often seems to give it less probability of normal eruption . . . probably because it is more difficult for the anlage of the permanent tooth to resorb and push through the now scarred and compact bone and mucous membrane than to resorb the root of the deciduous tooth." He also pointed out that "very early loss of upper deciduous incisors, especially the central incisors, often results in a 'leathery' hardening of the gingiva, caused by biting on it, which hinders the eruption of the permanent incisors."

Recognizing and accepting the etiological role of a nonvital deciduous incisor in the malposition and retarded eruption of its permanent successor do not necessarily indicate the proper management of these teeth in order to prevent malocclusion. Nor is it considered within the province of this article to make recommendations beyond suggesting an attempt to maintain the infected deciduous tooth as nearly comparable to its normal counterpart as possible. Part of the answer may lie in the difficult processes of root canal therapy, in drainage, and in extraction slightly in advance of the normal deciduous tooth loss.

DELAYED ERUPTION OF MANDIBULAR SECOND PREMOLAR

An anomaly frequently observed by an orthodontist or dentist is the overretention of one or both mandibular second deciduous molars and the associated delayed eruption of the second premolar. This must be considered a sequential anomaly of eruption, although at times it may be due to an ectopic eruptive position of the premolar. Not only may this particular combination of circumstances lead to malposition of the premolar concerned, but it also may have a resultant effect upon the ultimate occlusion of the entire mouth.

This not unusual finding of an overretained mandibular second deciduous molar may be caused by:

1. The greater mesiodistal diameter of the deciduous molar than that of the premolar and the resultant resorption of only one root of the deciduous tooth (Fig. 8).

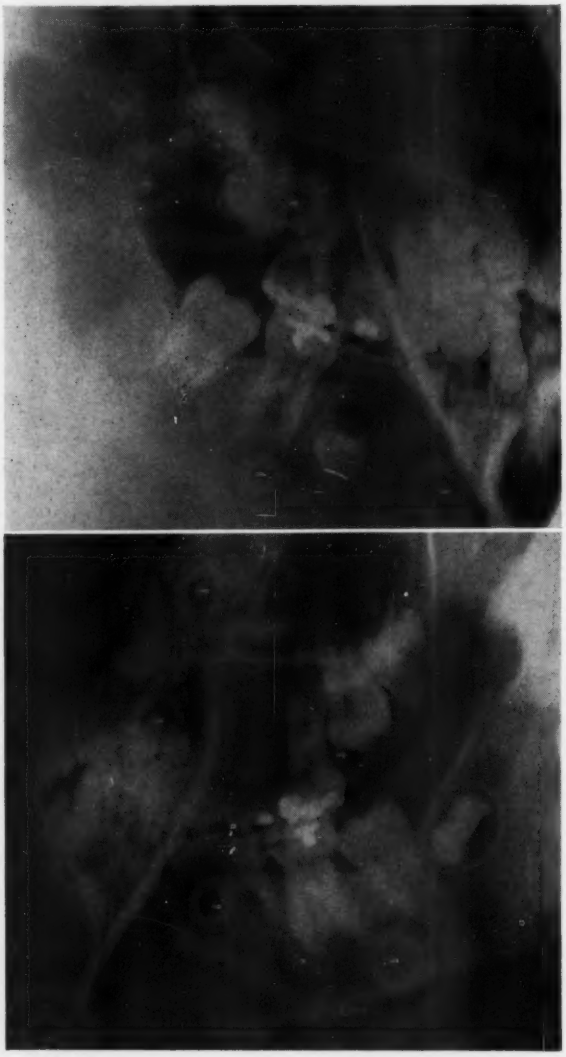
Fig. 8.—Lateral jaw roentgenogram showing overretained mandibular second deciduous molar and failure of fully calcified second premolar to resorb distal root.

Fig. 9.—Lateral jaw roentgenogram showing overretained mandibular second deciduous molar and distal ectopic eruptive position of second premolar.

2. An ectopic eruptive position of the premolar, a position in which the resorption of only one deciduous root is possible (Fig. 9).

3. Delayed or rudimentary formation of the premolar, a circumstance which may be noted particularly when the premolar on the opposite side of the jaw is congenitally missing (Fig. 10) or even when a sibling presents with congenital absence of one or both mandibular second premolars.

A.



B.

Fig. 10.—*A*, Lateral jaw roentgenogram showing overretained mandibular left second deciduous molar and delayed calcification of underlying premolar. *B*, Right side of same mouth showing congenitally missing mandibular second premolar.

Concerning this particular problem, Salzmann[8] stated that there may be "asymmetric root resorption of the deciduous molar roots whereby one root only is resorbed. Whether this type of resorption is due to pre-eruptive mal-

position or whether the asymmetric resorption leads to malposition is difficult to say. In either event, it is important that the condition be disclosed and the deciduous molar be extracted at a favorable time in order to prevent or minimize the extent of malposition of the permanent tooth."

Whatever the cause may be, the consequences of overretention of the mandibular second deciduous molar vary from case to case and may be of marked orthodontic significance. The possible sequellae include:

1. Delayed but natural loss of the deciduous molar, followed by delayed but satisfactory eruption of the underlying premolar and adequate establishment of the mandibular arch.
2. Extraction of the overretained deciduous molar, followed by
   (a) Delayed but satisfactory eruption of the underlying premolar and adequate establishment of the mandibular arch.
   (b) Noneruption of the underlying premolar, space closure (particularly where the permanent second molar has erupted or is erupting), and ultimately insufficient space to accommodate the premolar when it erupts. Because of this possibility, the advisability of the surgical exposure of the premolar at the time of deciduous tooth extraction must be considered in those cases in which the occlusal surface of the permanent tooth is still covered by bone.
   (c) Noneruption of the underlying premolar and maintenance of the space until its eruption. Space maintenance in these instances must be discontinued after the premolar eruption starts. If continued until eruption is completed, rotation and migration of the premolar may occur in the absence of guiding proximal contacts and surfaces. As Salzmann[9] stated: "Rotation of teeth is usually a concomitant of crowding, but occurs also in cases in which the space usually allotted for a tooth is so large as to interfere with the establishment of proximal contact between the erupting tooth crown and the adjacent teeth."
3. Continued overretention of the deciduous molar, possibly resulting in
   (a) An excess of tooth structure in the mandibular dental arch. The combined mesiodistal diameter of the mandibular teeth present is increased to the point of instability when the permanent second molars have erupted or are erupting. The result may be (1) crowding in the lower arch, generally in the incisor area, with possible ramifications throughout the arch, even extending to the

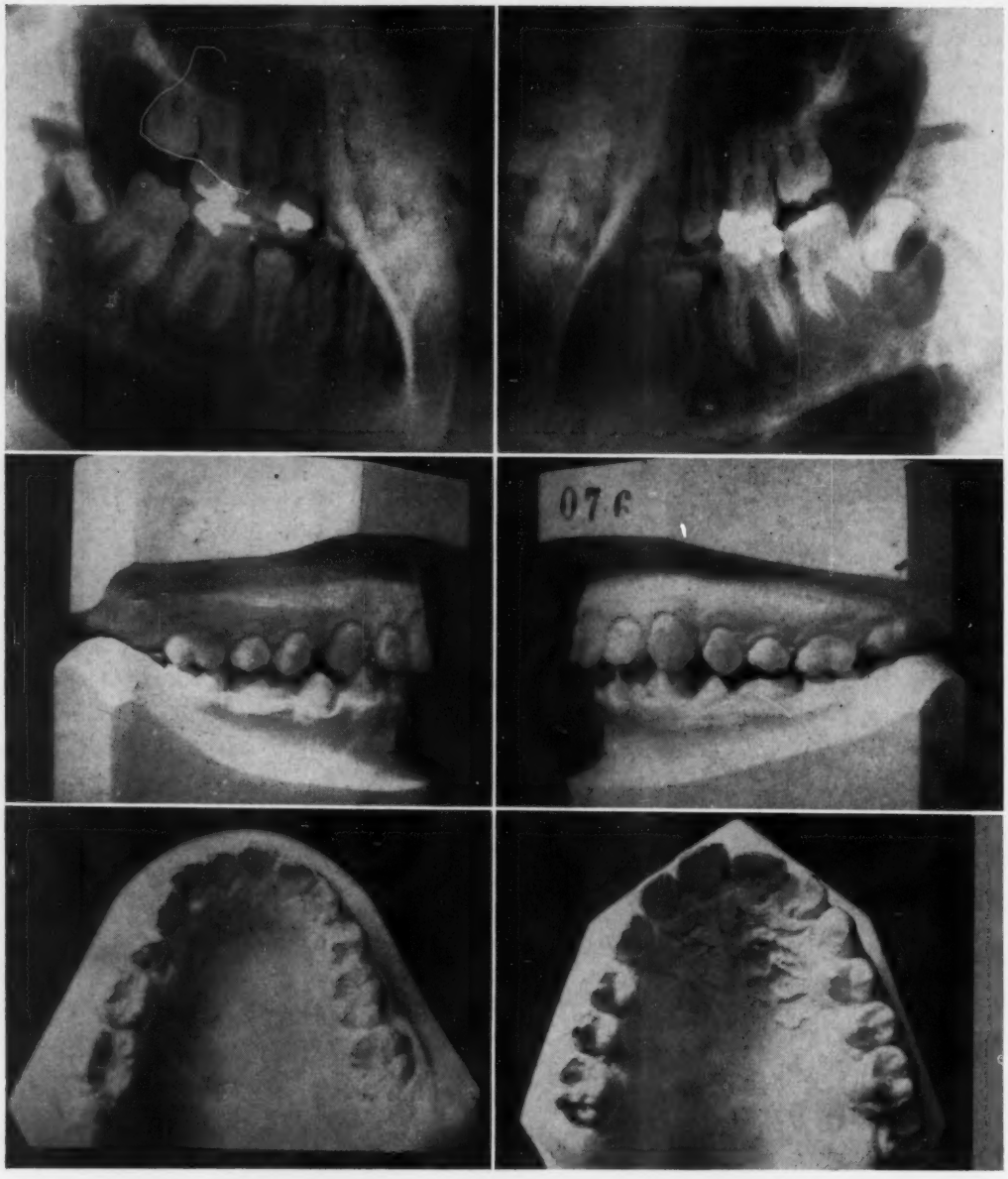
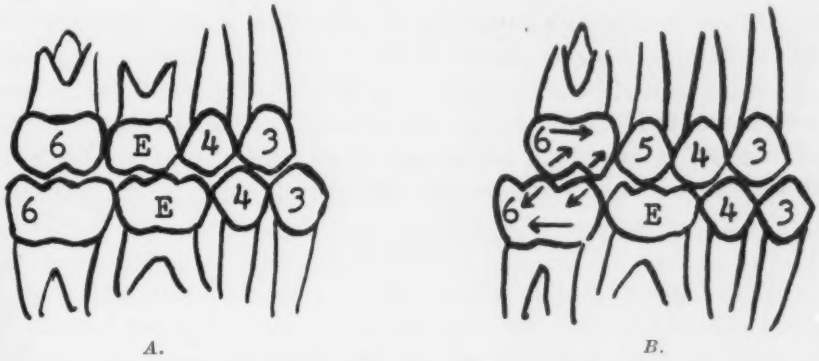


Fig. 11—*A* and *B*, Left and right lateral jaw roentgenograms showing presence of over-retained mandibular second deciduous molars, fully calcified second premolars, and erupting permanent second molars. *C* and *D*, Left and right views of study casts of same mouth showing excessive width of deciduous second molars in mandibular arch. *E* and *F*, Occlusal views of mandibular and maxillary study casts of same mouth showing developing crowding of mandibular incisors and resulting displacement of maxillary right permanent central incisor.

maxillary arch (Fig. 11), or (2) forward movement of the mandibular teeth along the bony arch, which in turn may produce an increasing tendency toward a Class III malocclusion, as reported by Lo and Moyers.[5]

(b) Maintenance of the mandibular permanent first molar in a position distal to that which it would ordinarily assume in the mandibular arch and relative to the maxillary teeth. Since the overretention of the maxillary second deciduous molar is far less frequent than a similar occurrence in the mandible, the altered interdigitation that may be established as the maxillary permanent first molar moves mesially may produce forces capable of causing a Class II malocclusion, as represented schematically in Fig. 12.

Baume[10] has pointed out: "A pressure in a mesial direction exists as long as the process of eruption by the successional teeth goes on. Since the mandibular premolars are narrower than their deciduous predecessors, some space is provided when the lower second deciduous molars are shed. The subsequent mesial migration of the lower permanent first molar changes their end-to-end relationship to a normal one. This is the last adjusting mechanism of the permanent molar occlusion."



A. *B.*

Fig. 12.—*A*, Schematic representation of normal occlusion with maxillary and mandibular second deciduous molars in position. *B*, Subsequent mesial movement of maxillary permanent first molar following loss of second deciduous molar. Arrows indicate direction of forces established by new permanent molar cuspal relationship.

Furthermore, he has stated: "A pronounced mesial migration of the maxillary teeth, particularly when it is absent in the mandible, invariably produces malocclusion of the permanent molars, i.e., distocclusion. . . . The practical application of these findings to the problem of clinical orthodontics emphasizes the importance of changing an end-to-end occlusion of the first molars into their proper cuspal interdigitation as early as possible."

In most circumstances of existing malocclusion, even if the causative factors could be recognized and understood, the malocclusion would remain

unpreventable, at least by the dentist or orthodontist. The hereditary, congenital, and developmental factors involved are simply beyond control. However, where the malocclusion, or one aspect of it, is the result of a recognizable, preventable, developmental anomaly, such as overretention of the second deciduous molar, preventive orthodontic interception through the medium of extraction is possible and is of maximum importance.

The question arises: At what point does retention become overretention? Charts of eruption are, at best, indications of averages rather than rules for individual cases. The sequence of eruption would be a more reliable guidepost but, even then, wide discrepancies within the normal range may exist, with the additional complication that various investigators differ in opinion as to what is the typical eruptive sequence.

The best criterion would be not a chart of chronology or sequence of eruption, but a determination of the readiness for eruption of the particular premolar involved. This would be indicated by its root length, generally accepting calcification of one-half the root length as the critical stage. Weber[11] states: "If the roentgenograms reveal that the calcification of the roots of the unerupted permanent tooth has progressed as far as halfway to completion . . . or that the resorption of the roots of the primary tooth is complete on one aspect of a root or one root of a multi-rooted tooth, the ectopic relationship of the succedaneous tooth should be recognized and the primary tooth extracted."

The warning that extraction of the primary tooth does not guarantee eruption of the permanent tooth bears repetition. Surgical uncovering of the permanent tooth may be required, as may space maintenance to the point where eruption begins but generally not beyond that point. The possibility remains that the problem is not one of anomalous tooth eruption, but one of undetectable anomalous tooth formation, in which instance neither extraction, surgical uncovering, nor space maintenance may remedy the situation.

SUMMARY

Among the factors initiating or complicating malocclusions are anomalies of tooth eruption. Under consideration here were (1) the anomalous malposition and retarded eruption of the maxillary permanent central incisor which may follow traumatization and devitalization of the deciduous predecessor and (2) the anomalous retarded, and perhaps ectopic, eruption of the mandibular second premolar associated with overretention of the deciduous second molar.

Thirty-seven cases of anomalous maxillary permanent central incisor eruption were investigated, leading to the conclusions that:

1. Lingual eruption of these teeth was due to the lessened resorptivity of a retained nonvital deciduous tooth.

2. Labial eruption followed early extraction of the nonvital deciduous tooth, eliminating a normal barrier to the usual downward and forward eruptive path of the permanent tooth.

3. Retarded eruption may be the result of the formation of a fibrous tissue at the site of deciduous tooth infection, forming a retarding barrier to eruption.

Overretention of a mandibular second deciduous molar can result in generalized malocclusion where:

1. Excessive tooth structure is present in an arch containing deciduous second molars as well as permanent second molars, causing crowding within the arch or increasing a potential toward a Class III malocclusion.

2. The mandibular second deciduous molars have been retained while the maxillary second deciduous molars have been shed, permitting establishment of a permanent molar cuspal relationship wherein there are forces capable of producing a Class II malocclusion.

In cases where the overretained deciduous molar has been extracted as a preventive measure, the result may be a localized malposition involving an ectopically erupting premolar into a space that:

1. Remained or was maintained oversize, permitting rotation in the absence of proximal contact.

2. Closed excessively, particularly in the presence of an erupted or erupting permanent second molar, causing blocking out of the premolar.

CONCLUSION

The practicing orthodontist, while recognizing the importance of all the etiological factors capable of producing malocclusion, is clinically concerned with those which fall within his control. Admitting his limitations, he must accept certain influences, such as the genetic ones, hoping to overcome them through treatment, and he must be on the lookout for others, particularly the local ones, hoping to prevent them through recognition and interception.

Within this frame of reference the ectopic or retarded eruption of certain permanent teeth may be considered as preventable, recognizable symptoms of an orthodontic problem. The anomalous eruption of the maxillary permanent central incisor predictably follows a particular traumatic experience of its predecessor and that of the mandibular second premolar is demonstrably related to overretention of the deciduous molar. As manifestations of malocclusion, these teeth may constitute the total orthodontic deviation, or they may be a relatively minor aspect of that deviation. In either case, they remain worthy of careful consideration, anticipation, and evaluation, particularly in view of the secondary etiological effect which they may have upon the occlusion of the entire mouth.

REFERENCES

1. Orban, Balint: Oral Histology and Embryology, St. Louis, 1944, The C. V. Mosby Company, chap. X.
2. Gesell, Arnold, and Ilg, Frances L.: Infant and Child in the Culture of Today, New York and London, 1943, Harper & Brothers, chap. XVI.

3. Byrd, Worth M.: The Prevalence of Ectopic Eruption of the Permanent Teeth in Children Between 5 and 10 Years of Age (Abstract), AM. J. ORTHODONTICS **42**: 153, 1956.
4. Anderson, George M.: Treatment Procedures of Simple Form Which Have Proved Their Worth, AM. J. ORTHODONTICS **37**: 181-187, 1951.
5. Lo, Robert T., and Moyers, Robert E.: Studies in the Etiology and Prevention of Malocclusion. I. The Sequence of Eruption of the Permanent Dentition, AM. J. ORTHODONTICS **39**: 460-467, 1953.
6. Bauer, William H.: Effect of Periapical Processes of Deciduous Teeth Upon the Buds of the Permanent Teeth, AM. J. ORTHODONTICS & ORAL SURG. **32**: 232-241, 1946.
7. Kjellgren, Birger: Serial Extraction as a Corrective Procedure in Dental Orthopedic Therapy, Acta odont. scandinav. **8**: 17-43, 1948.
8. Salzmann, J. A.: Principles of Orthodontics, Philadelphia, 1943, J. B. Lippincott Company, chap. 8.
9. Salzmann, J. A.: The Prevention and Interception of Malocclusion, AM. J. ORTHODONTICS **34**: 732-757, 1948.
10. Baume, Louis J.: Physiological Tooth Migration and Its Significance for the Development of Occlusion. I. The Biogenesis of the Accessional Dentition, J. D. Res. **29**: 331-337, 1950.
11. Weber, Faustin N.: Prophylactic Orthodontics, AM. J. ORTHODONTICS **35**: 611-635, 1949.

10 FISKE PL.

AN ELECTROMYOGRAPHIC STUDY OF THE TEMPORALIS MUSCLE IN NORMAL PERSONS DURING SELECTED POSITIONS AND MOVEMENTS OF THE MANDIBLE

A. LATIF, M.B.B.S., M.A.,* TORONTO, ONTARIO

THE temporalis muscle has been the focus of attention of research workers in the dental field during the past few years. Considerable difference of opinion exists concerning its role in the various movements of the mandible.

According to Keith[2] the temporalis muscle is not active during end-to-end biting. MacDougall and Andrew,[3] on the basis of electromyographic studies, disagree with him.

The opinion that the anterior fibers of the muscle are active during protraction of the mandible was held by McCollum[4] and was opposed by Robinson[7] and Carlsoo.[1] Moyers[5] stated that all parts of the muscle were active during forced protraction.

A resting tonus, responsible for the maintenance of the mandibular posture, has been claimed by Moyers,[5] Carlsoo,[1] and MacDougall and Andrew.[3] Moyers stated that this activity is uniformly distributed in all the fibers of the muscle in persons with normal dentofacial structure but not in cases of mandibular retrogression, where the posterior fibers show more activity. He thought that this imbalance in the distribution of the activity was an etiological factor in the retrogression of the mandible. Neither Carlsoo nor MacDougall and Andrew discussed the distribution of this resting tonus.

Efforts are being made to introduce electromyography as a routine diagnostic and prognostic measure in clinical dentistry, but no satisfactory method has been established.

With these considerations in mind, an electromyographic study of the temporalis muscle in children aged 10 to 14 years with normal dentofacial structure was undertaken. The research objective was to investigate (1) a method of surface electromyography that compares favorably with needle electromyography; (2) the action of the muscle in various movements and positions of the mandible; and (3) whether the resting tone is present in all the fibers of the muscle and, if so, whether it is uniformly distributed.

MATERIAL AND METHODS

The study was carried out at the Orthodontic Research Centre, Burlington, Ontario; children aged 10 to 14 years, with normal dentofacial structure,

From the Department of Anatomy, University of Toronto.

This paper forms a part of the thesis submitted to the Department of Anatomy, University of Toronto, in conformity with the requirements for the degree of Master of Arts, May, 1956.

*Colombo Plan Fellow from Pakistan. Permanent address: Department of Anatomy, Dow Medical College, Karachi.

were used as subjects. The selection of the subjects was made possible by the information provided in the records of the Centre and the help of the dental specialists working with this material.* The total number of subjects studied was twenty-five (sixteen boys and nine girls).

Apparatus.—A four-channel Grass Electroencephalograph, Model III, equipped with a magnetic ink writer and consisting of preamplifiers and power amplifiers, was used.

A preamplifier consists of first and second stages of voltage amplification and a power amplifier has third and fourth stages of voltage amplification and a single final stage of power amplification.

Throughout the study the apparatus was switched to "EMG position" which selects the coupling condensers between the third and the fourth stages and fourth and final stages to get a frequency response from the amplifiers suitable for "muscle action potentials."

The frequency spectrum on EMG positions ranges from 0.5 to 200 cycles per second, but the best response is from 1 to 100 cycles per second.

The "muscle filter switch" was kept off. This switch is turned on in EEG studies to cut off the high-frequency responses.

There are four controls for changing the amplification:

1. "X50-X1 switch" changes amplification by a factor of 50.
2. "X 1.5 switch" increases amplification by 1.5 per step.
3. "Equalization switch" varies signals, giving 10 per cent increase per step.
4. "Reduction switch" decreases on all channels by 1.5 per step.

The records were taken by the ink pens on the motor-driven paper, the speed of which could be controlled at 15 mm. per second, 30 mm. per second, and 60 mm. per second.

For the purposes of comparison, records on one subject were taken on a Stanley Cox special electromyograph equipped with audio and visual units.†

Electrodes.—Surface electrodes were used. These were cup-shaped disks, 8 mm. in diameter, with a hole at the center. Electrode jelly was used as an electrolyte and colloidin as a dermal adhesive.

A bipolar concentric needle electrode was used in one case along with the surface electrodes to compare the "pick-up."

Electrode Placements.—Bilateral observations were done on all the subjects. The temporalis muscle was divided into two parts, an anterior and a posterior. A pair of electrodes was placed on each part.

Before placing of the electrodes, the extent of the muscle was found by palpating it while the subject was biting on his back teeth. The placement was done in most cases within the hairy margin because it was found that the

*The selection was based on the unpublished work of Dr. F. Popovich, director of the Centre.

†Specially built for Dr. J. V. Basmajian by Stanley Cox Ltd., London, England.

skin resistance could be lowered more easily there than on the hairless exposed part of the temple. The region of the orbicularis oculi muscle also was avoided, as there was always an electrical interference due to blinking whenever the electrodes were placed over this muscle.

The two electrodes of a pair were placed side by side, their centers being 0.5 inch apart. The colloidin was applied on their margins and dried with an electric hair drier.

The skin resistance was lowered equally at all sites by rubbing the skin with a blunt probe through the hole of the electrode and injecting the electrode jelly via the same route. It was measured by an ohmmeter and was brought well below 3,000 ohms in all cases.

The subject was grounded by a silver earring electrode. The results obtained with this method of electrode placement compare favorably with those obtained with bipolar concentric needle electrodes. It was possible to get single motor units recorded in many cases (Fig. 1), which shows that the method compares favorably with needle electromyography.

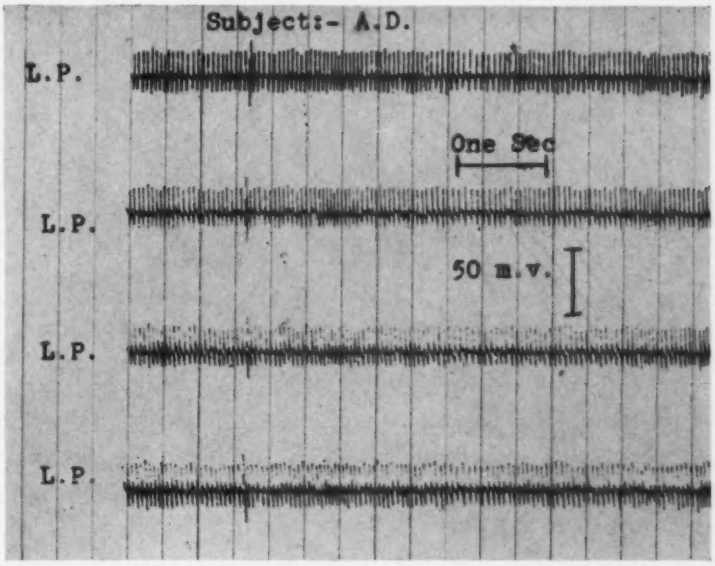


Fig. 1.—Single "action potentials" recorded with the bipolar surface electrodes used in this study. All four channels recorded from the posterior fibers of the left temporalis muscle of the subject A.D.

Recording Procedure.—The subject was seated on a chair, in an upright posture, facing the apparatus.

The study of the function of the muscles during the physiologic resting position of the mandible was done at the beginning and at the end of each experiment because of the possibility of increased tonus due to initial apprehension of the subject. These records were taken at seven different amplifications.

The other positions and movements of the mandible selected to record the action of the muscle were abduction, protraction, depression, and centric

(molar) and end-to-end (incisor) occlusions. These were practiced by the subject before the actual recordings were made.

Details of age, sex, and pertinent remarks for each of the twenty-five subjects are presented in Table I.

TABLE I. MATERIAL FOR THE STUDY OF TEMPORALIS

	NAME	SEX	AGE	REMARKS
1	B. A.	F	13 2/12	Cannot move the jaw easily to the right
2	C. B.	F	13 10/12	
3	M. B.	M		
4	L. B.	M	13 2/12	Repeated once
5	J. B.	M	13 2/12	
6	B. B.	M	11 11/12	
7	W. C.	M	10 3/12	
8	R. C.	M	13 6/12	
9	A. D.	M	13 6/12	Cannot move the jaw easily to the right
10	M. D.	M	13 6/12	Cannot move the jaw easily to the right
11	E. E.	F	12 2/12	
12	J. G.	M	13 8/12	Cannot have "end-to-end" occlusion without molars contacting — Repeated three times
13	E. H.	F	12 4/12	
14	R. J.	M	12 10/12	Repeated three times
15	S. K.	F	12 7/12	
16	J. G. L.	M	12 3/12	
17	H. L.	M	13 3/12	
18	L. R.	M	12 7/12	
19	D. L.	F	11 8/12	
20	D. S.	M	12 11/12	
21	S. S.	F	13 2/12	
22	C. A. S.	F	12 0/12	
23	J. T.	M	13 9/12	
24	J. W.	M	13 7/12	
25	L. W.	F	13 1/12	

RESULTS

1. *Resting Tonus.*—In the physiologic resting position of the mandible, both the anterior and the posterior fibers of the muscle exhibited activity in all the subjects, except two in whom the right anterior fibers had no activity at rest.

The resting tonus was not uniformly distributed throughout the muscle (Fig. 2). In the fifty muscles studied, posterior fibers were more active in 84 per cent, anterior in 6 per cent, and tonus was equal in anterior and posterior fibers in 10 per cent.

In one case the resting tonus in the anterior fibers was studied simultaneously with the bipolar concentric needle electrodes and the bipolar surface electrodes to confirm whether the resting activity picked up by the bipolar surface electrodes was actually present. The "pick-up" by the needle electrode also showed that activity was present. Because Moyers, who used surface unipolar electrodes with reference electrode on the ear lobe, claimed that the resting tonus is equal in the anterior and the posterior fibers in nor-

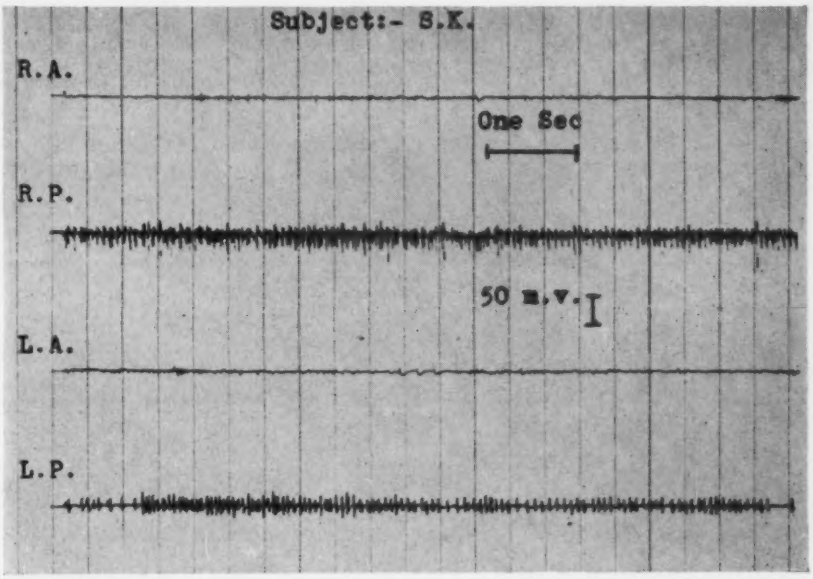


Fig. 2.—Resting tonus. Electromyogram showing activity in the anterior and posterior parts of the temporalis muscle recorded during physiologic resting position of the mandible. *R.A.*, Right anterior; *R.P.*, right posterior; *L.A.*, left anterior; *L.P.*, left posterior.

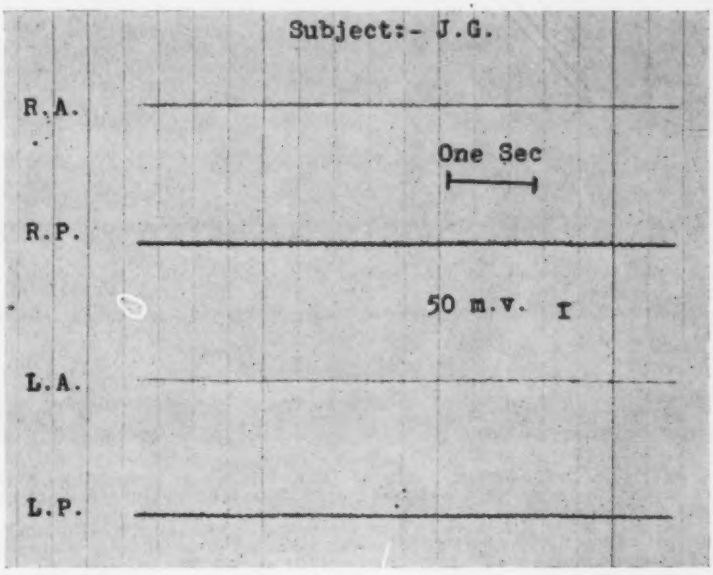


Fig. 3.—Resting tonus. Activity in the temporalis muscle during physiologic resting position of the mandible recorded with the bipolar surface electrodes, showing that the posterior fibers are more active. *R.A.*, Right anterior; *R.P.*, right posterior; *L.A.*, left anterior; *L.P.*, left posterior.

mal subjects, records in the physiologic resting position were taken using his method. These were compared with the results obtained by the bipolar surface electrodes and the concentric needle electrode. It was found that the spikes obtained by Moyers' method were mixed with some interference that concealed the difference in the amount of activity in the anterior and posterior fibers (Figs. 3, 4, and 5).

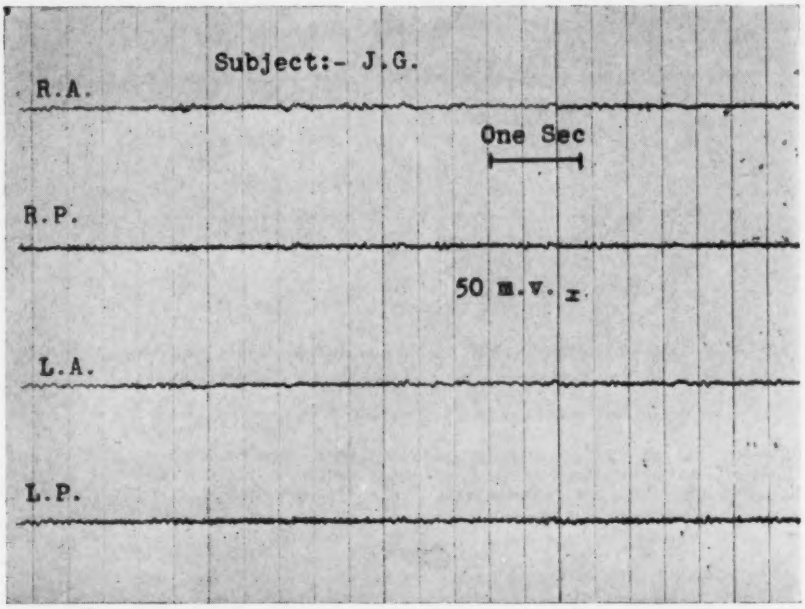


Fig. 4.—Resting tonus. Activity in the temporalis muscle during physiologic resting position of the mandible recorded with the unipolar surface electrodes with reference electrode on the ear lobe (Moyers' method). The spikes are mixed with electrical interference that conceals the difference in the amount of activity in the anterior and posterior fibers (Fig. 3). *R.A.*, Right anterior; *R.P.*, right posterior; *L.A.*, left anterior; *L.P.*, left posterior.

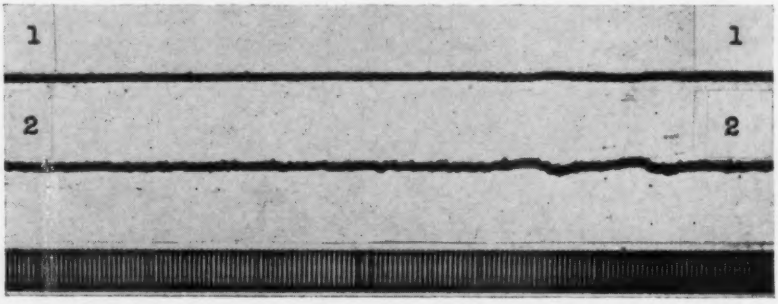


Fig. 5.—Activity in the temporalis muscle (anterior part) during the physiologic resting position of the mandible recorded simultaneously with bipolar concentric needle electrodes (channel 1) and unipolar surface electrode with reference electrode on the ear lobe (Moyers' method) (channel 2). This shows that interference is picked up by the unipolar electrode during recording. (This recording was done on Stanley Cox special electromyograph. At the bottom is the time marker showing 100 oscillations per second.)

It appears, therefore, that placing the reference electrode as far away as the ear introduces extraneous electrical interference into the records.

2. *Right Lateral Position.*—The records were taken in the static condition of the extreme right lateral abduction of the mandible. In this position the

right temporalis shows increased activity, which was more marked in the posterior fibers (Fig. 6).

In three subjects this increased activity in the right temporalis was either absent or very slight. They complained, however, that they could not easily bring the mandible into the right lateral position.

The left temporalis had no activity above the level of the resting tonus, except in five subjects in whom there was slightly increased activity in the left posterior fibers. No increased activity in the left anterior fibers was detected.

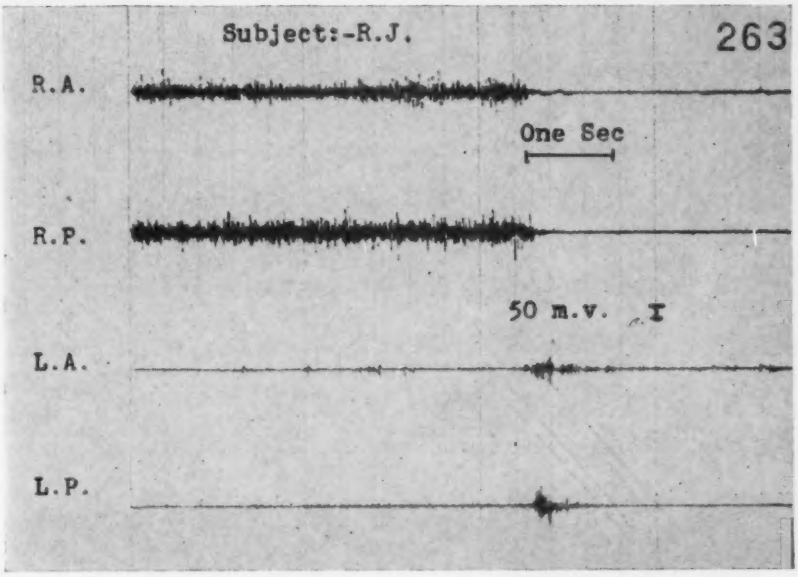


Fig. 6.—Right lateral position of the mandible. Activity in the right anterior (*R.A.*) and right posterior (*R.P.*) fibers of the temporalis muscle. No activity in the left anterior (*L.A.*) and left posterior (*L.P.*) fibers above the level of the resting tonus. Note the short burst of activity in the left anterior and posterior fibers during return movement of the mandible from the right lateral position to physiologic resting position.

During the return movement of the mandible from the right lateral position to the resting one, there was activity of a short duration in the left anterior and posterior fibers.

The analysis of the findings in fifty temporalis muscles studied follows:

Greater activity in the right posterior fibers—72 per cent

Greater activity in the right anterior fibers—0 per cent

Equal activity in the right anterior and posterior fibers—16 per cent

No activity in the right anterior and posterior fibers—12 per cent

Slight activity in the left posterior fibers—20 per cent

Slight activity in the left anterior fibers—0 per cent

mal subjects, records in the physiologic resting position were taken using his method. These were compared with the results obtained by the bipolar surface electrodes and the concentric needle electrode. It was found that the spikes obtained by Moyers' method were mixed with some interference that concealed the difference in the amount of activity in the anterior and posterior fibers (Figs. 3, 4, and 5).

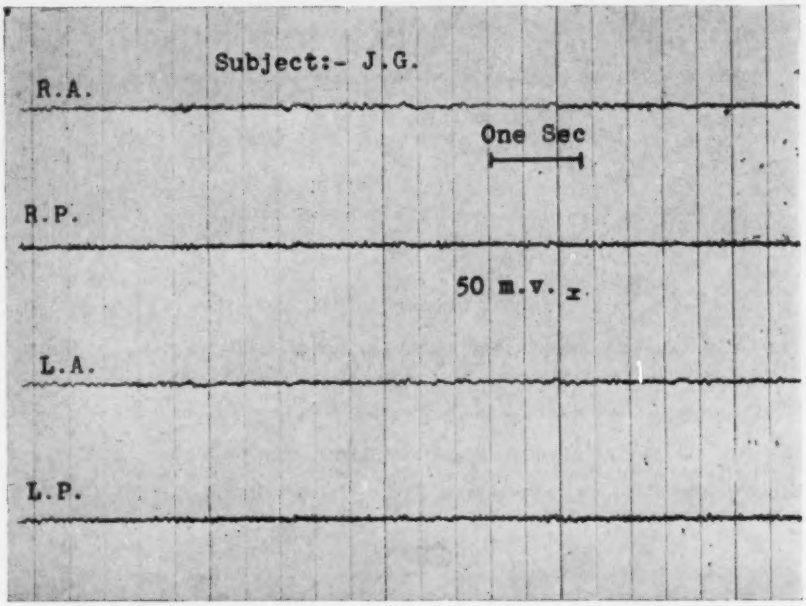


Fig. 4.—Resting tonus. Activity in the temporalis muscle during physiologic resting position of the mandible recorded with the unipolar surface electrodes with reference electrode on the ear lobe (Moyers' method). The spikes are mixed with electrical interference that conceals the difference in the amount of activity in the anterior and posterior fibers (Fig. 3). *R.A.*, Right anterior; *R.P.*, right posterior; *L.A.*, left anterior; *L.P.*, left posterior.

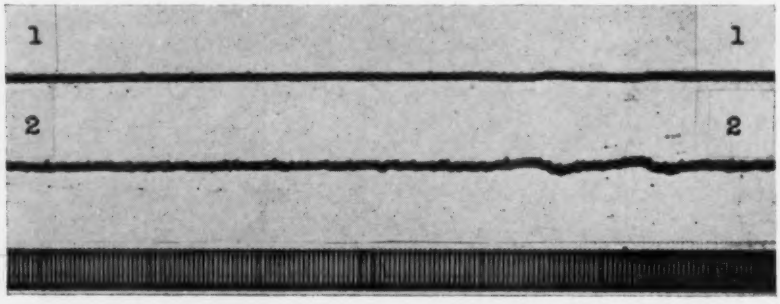


Fig. 5.—Activity in the temporalis muscle (anterior part) during the physiologic resting position of the mandible recorded simultaneously with bipolar concentric needle electrodes (channel 1) and unipolar surface electrode with reference electrode on the ear lobe (Moyers' method) (channel 2). This shows that interference is picked up by the unipolar electrode during recording. (This recording was done on Stanley Cox special electromyograph. At the bottom is the time marker showing 100 oscillations per second.)

It appears, therefore, that placing the reference electrode as far away as the ear introduces extraneous electrical interference into the records.

2. *Right Lateral Position.*—The records were taken in the static condition of the extreme right lateral abduction of the mandible. In this position the

right temporalis shows increased activity, which was more marked in the posterior fibers (Fig. 6).

In three subjects this increased activity in the right temporalis was either absent or very slight. They complained, however, that they could not easily bring the mandible into the right lateral position.

The left temporalis had no activity above the level of the resting tonus, except in five subjects in whom there was slightly increased activity in the left posterior fibers. No increased activity in the left anterior fibers was detected.

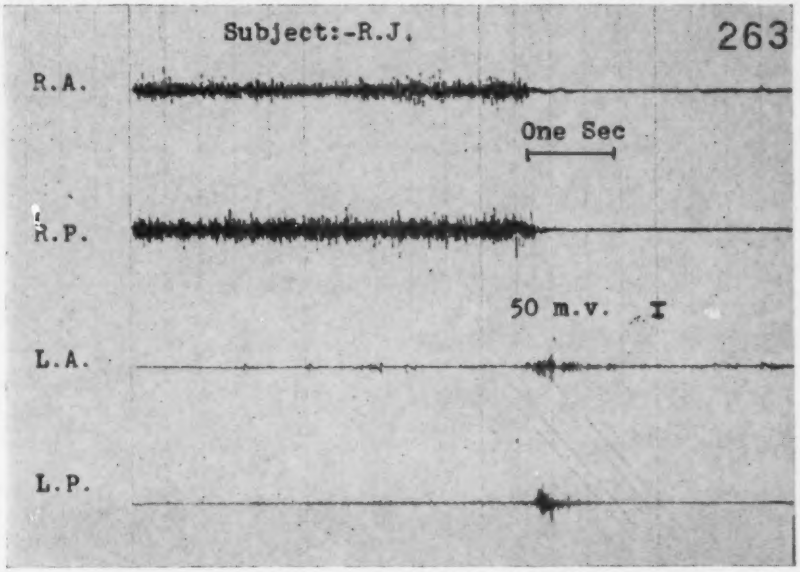


Fig. 6.—Right lateral position of the mandible. Activity in the right anterior (*R.A.*) and right posterior (*R.P.*) fibers of the temporalis muscle. No activity in the left anterior (*L.A.*) and left posterior (*L.P.*) fibers above the level of the resting tonus. Note the short burst of activity in the left anterior and posterior fibers during return movement of the mandible from the right lateral position to physiologic resting position.

During the return movement of the mandible from the right lateral position to the resting one, there was activity of a short duration in the left anterior and posterior fibers.

The analysis of the findings in fifty temporalis muscles studied follows:

Greater activity in the right posterior fibers—72 per cent

Greater activity in the right anterior fibers—0 per cent

Equal activity in the right anterior and posterior fibers—16 per cent

No activity in the right anterior and posterior fibers—12 per cent

Slight activity in the left posterior fibers—20 per cent

Slight activity in the left anterior fibers—0 per cent

3. *Left Lateral Position.*—The results obtained were similar to those found in the right lateral position, except that here the left temporalis, rather than the right, was active (Fig. 7).

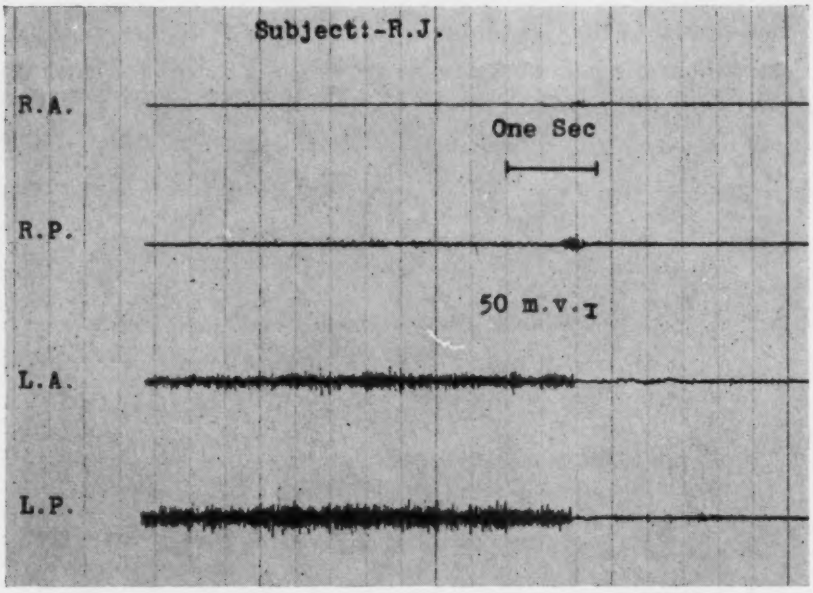


Fig. 7.—Left lateral position of the mandible. Activity in the left anterior (*L.A.*) and left posterior (*L.P.*) fibers. No activity in the right anterior (*R.A.*) and right posterior (*R.P.*) fibers above the level of resting tonus. Note burst of activity in the right anterior and posterior fibers during return movement of mandible to physiologic resting position.

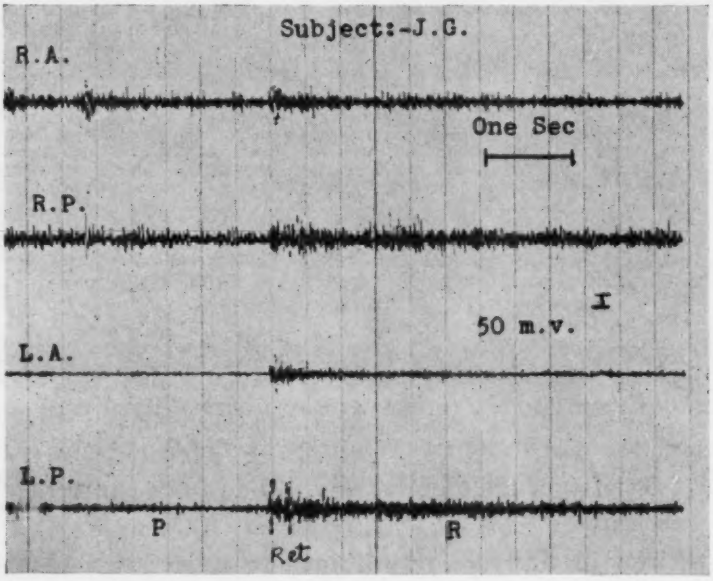


Fig. 8.—Protraction of mandible. During protraction (*P.*) the activity in all parts of the muscle is decreased below the level of basic resting tonus (*R.*). During retraction (*Ret.*) from protraction there is increased activity in all the parts of the muscle. *R.A.*, Right anterior; *R.P.*, right posterior; *L.A.*, left anterior; *L.P.*, left posterior.

The main results were as follows:

Greater activity in the left posterior fibers—60 per cent
Greater activity in the left anterior fibers—12 per cent
Equal activity in the left anterior and posterior fibers—28 per cent
No activity in the left anterior and posterior fibers—0 per cent
Slight activity found in right posterior fibers—8 per cent
Slight activity found in right anterior fibers —0 per cent

4. *Protraction.*—No activity was found in the muscle during this movement, except in two cases in which there was slight increase in the activity above the level of the resting tonus. On the other hand, in a considerable

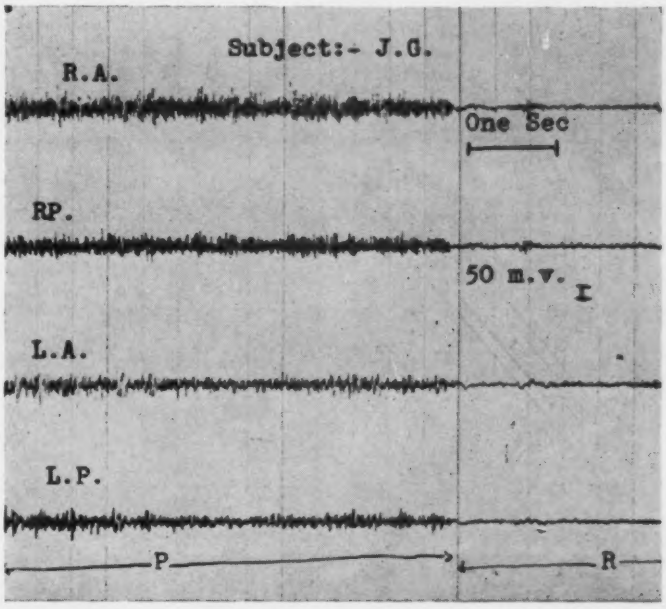


Fig. 9.—Forced protraction recorded with unipolar surface electrode with reference electrode on ear lobe, showing marked activity in all the parts of the muscle during forced protraction (*P.*). *R.*, Resting position.

number of subjects an actual decrease in the activity below the level of the basic resting tonus was observed (Fig. 8). The findings in the fifty muscles studied were as follows:

No change in activity in anterior fibers—60 per cent
No change in activity in posterior fibers—54 per cent
Decreased activity in anterior fibers—32 per cent
Decreased activity in posterior fibers—40 per cent
Increased activity in anterior fibers—8 per cent
Increased activity in posterior fibers—6 per cent

5. *Forced Protraction.*—Using bipolar surface electrodes, no activity above the level of resting tonus is recorded during forced protraction. Detailed studies in two subjects, where bipolar electrodes, unipolar electrodes, and bipolar concentric needle electrodes were used simultaneously, showed marked activity with the unipolar electrodes (Moyers' method) but no activity with the other techniques (Figs. 9 and 10). As the reference electrode in Moyers' method was placed far away, it appears that this activity was extraneous, coming from the lateral pterygoid muscle and other neighboring muscles.

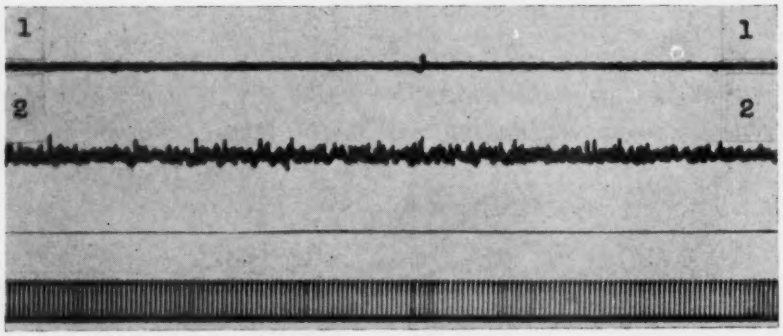


Fig. 10.—Forced protraction. Activity in the anterior fibers of temporalis muscle recorded simultaneously with bipolar concentric needle electrode (channel 1) and unipolar surface electrode with reference electrode on the ear lobe (Moyers' method) (channel 2), during forced protraction. Activity recorded by unipolar surface electrode appears to be extraneous coming from other muscles. (Recording done on Stanley Cox special electromyograph.)

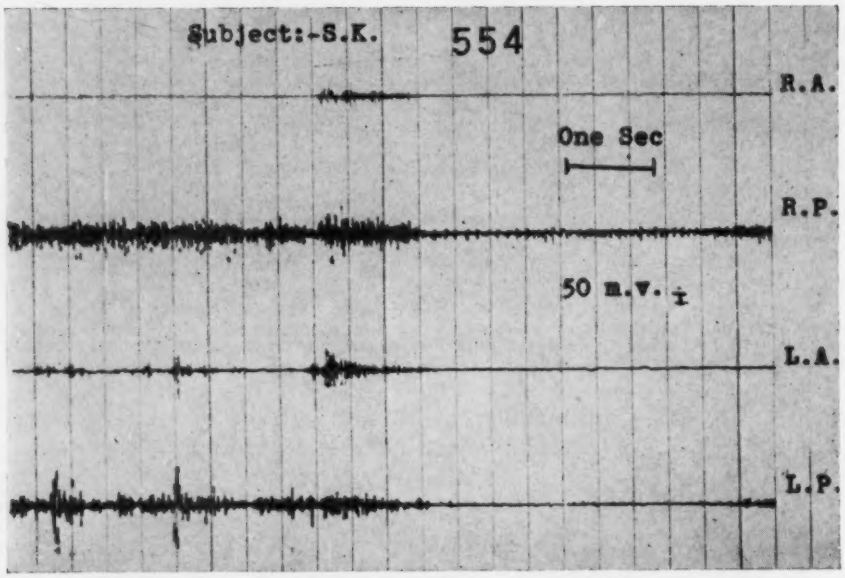


Fig. 11.—Maximal mouth opening. Irregular activity appears in anterior and posterior fibers during maximal mouth opening. The activity is greater in the posterior than in the anterior fibers. *R.A.*, Right anterior; *R.P.*, right posterior; *L.A.*, left anterior; *L.P.*, left posterior.

6. *Retraction.*—During the retraction of the mandible from the protracted position, an increase in the activity of temporalis was found. This was greater in the posterior fibers than in the anterior ones (Fig. 8).

7. *Maximal Mouth Opening.*—In ordinary opening of the mouth, no activity of the muscle has been observed.

When the mouth is opened with maximum effort, activity appears irregularly in the anterior and posterior fibers. In a majority of the subjects the activity is more in the posterior fibers than in the anterior ones (Fig. 11).

The results obtained are as follows:

Greater activity in the posterior fibers—56 per cent (in 50 temporalis muscles)

Greater activity in the anterior fibers—10 per cent

Equal activity in the anterior and posterior fibers—34 per cent

No activity in the anterior and posterior fibers—0 per cent

8. *Elevation.*—

Molar occlusion: All the fibers are very active during centric occlusion (Fig. 12).

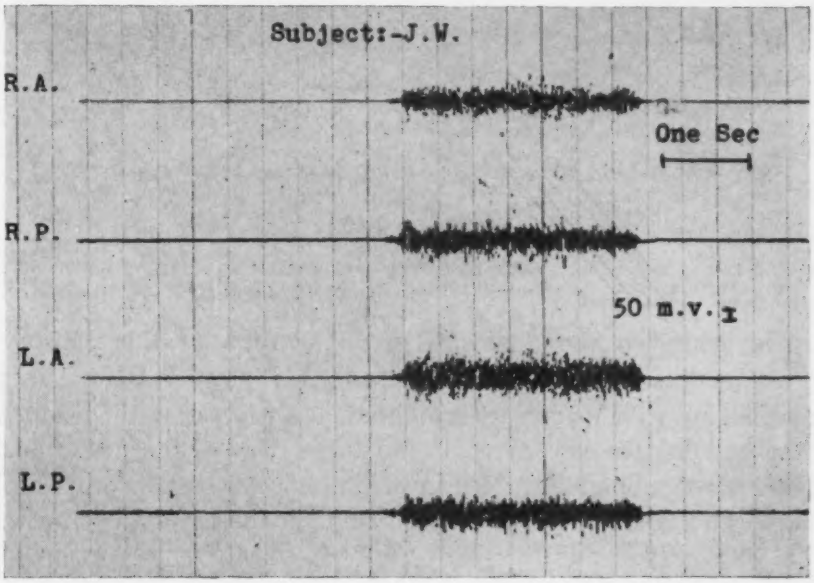


Fig. 12.—Molar occlusion. All the parts of the muscle are equally and maximally active. Recording done at lower amplification. (At this amplification the resting tonus cannot be demonstrated.) *R.A.*, Right anterior; *R.P.*, right posterior; *L.A.*, left anterior; *L.P.*, left posterior.

End-to-end occlusion (incisor bite): All the parts of the muscle are active, but greater activity is more frequent in the anterior fibers (Fig. 13).

The findings are given below:

Greater activity in anterior fibers—40 per cent (in 50 muscles)

Greater activity in posterior fibers—22 per cent (in 50 muscles)

Equal activity in anterior and posterior fibers—34 per cent

No activity in anterior and posterior fibers—4 per cent

DISCUSSION

Resting Tonus.—The resting activity in the muscle demonstrated by Moyers, Carlsoo, and MacDougall and Andrew has also been observed in the present study.

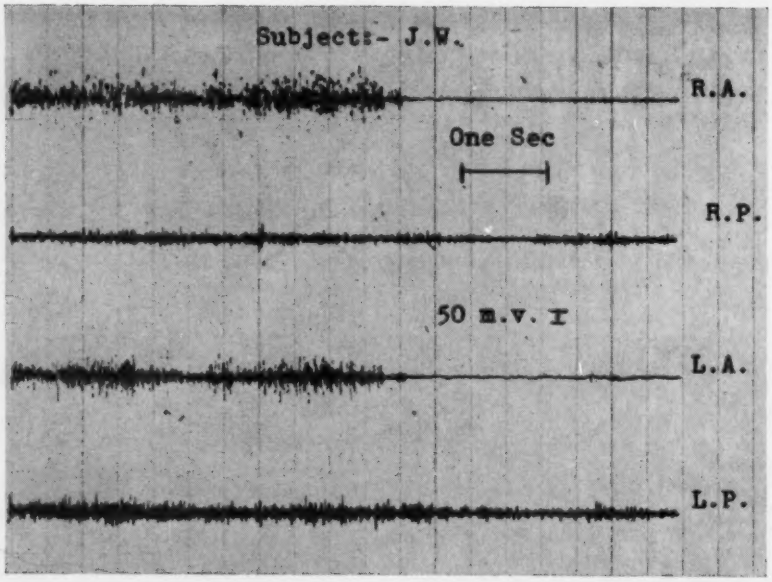


Fig. 13.—End-to-end occlusion. Activity is present in all the parts, although it is greater in anterior fibers (*R.A., L.A.*) than in the posterior ones (*R.P., L.P.*).

Moyers described the quantitative distribution of this activity in the muscle. He claimed that in normal persons this tonus was equal in all parts of the muscle, but in persons with mandibular retrogression the posterior fibers were more active. He considered the hyperactivity of the posterior fibers in these persons an etiological factor in mandibular retrogression. Carlsoo and MacDougall and Andrew did not discuss this quantitative distribution of the tonus.

In the present study it was found that in persons with normal dentofacial structure the resting tonus is not uniformly distributed in all the parts of the muscle. Eighty-four per cent of these subjects showed greater activity in the posterior fibers.

Moyers' findings, however, could be reproduced by using his method. His method was compared with the bipolar surface electrodes used in this study and the concentric needle electrodes. It was found that the spikes obtained with his method were mixed with interference that concealed the difference in the amount of activity in the anterior and posterior fibers. The interference was picked up because the reference electrode was placed too far away.

The view that the greater activity in the posterior fibers of the muscle in persons with mandibular retrogression is an etiological factor of the deformity cannot be held in the light of the findings that a similar pattern of activity is present in normal persons as well.

It may be concluded, from the observations of this study, that the temporalis muscle plays an active part in maintaining mandibular posture and that the posterior fibers are in play more than the anterior ones.

Lateral Position.—Lateral movements of the mandible are brought about by the lateral and the medial pterygoid muscles acting contralaterally.

Moyers described the ipsilateral action of the temporalis in the abduction of the mandible, stating that its posterior part is more active in this movement. This study supports the findings of Moyers. Such an action was observed in all subjects except three who could not perform lateral movements easily.

As a bilateral study was done, it was possible to demonstrate that during the return movement of the mandible the opposite muscle becomes active.

The slight activity in the posterior fibers of the opposite muscle during abduction is not a constant finding and no importance can be attached to it.

Obviously, it may be said that the temporalis muscle is an ipsilateral abductor and a contralateral adductor of the mandible.

Protraction.—The findings of this study are not in agreement with the opinion held by McCollum[4] that the anterior fibers are active during protraction. However, they support the view of Robinson,[7] MacDougall and Andrew,[3] and Carlsoo[1] that there is no activity in the muscle during protraction. In fact, in 92 per cent of the subjects no activity was recorded. The slight activity found in 8 per cent of the subjects was not constant and may have been due to other factors, such as elevation of the mandible.

Further support is given to Carlsoo's statement that the activity in the muscle is decreased during this movement by the finding that in 32 per cent of the subjects the activity was actually reduced below the level of the resting tonus. The reason for this loss of resting tonus appears to be that the temporalis muscle is not required to hold the mandible in the protruded position, the responsibility being shifted to the protruding muscle, that is, the lateral pterygoid.

Moyers' findings that during forced protraction all the fibers of the muscle are thrown into action could not be shown by either bipolar surface electrodes or bipolar concentric needles. However, when his method was used, spikes appeared during protraction. As argued before, this activity, in all probability, is extraneous and may be from lateral pterygoid muscle.

Retraction.—The observations that the muscle retracts the protruded mandible confirm the accepted teachings regarding the action of the muscle.

All the parts of the muscle come into play, although the activity is somewhat greater in the posterior region.

Depression.—The depression of the mandible is brought about by the lateral pterygoid, the suprahyoid muscles, and gravity. The situation of the temporalis muscle is not such as to affect this movement.

During this study, no action of the muscle was recorded during the ordinary opening of the mouth, but when the mouth was opened maximally irregular activity appeared. These observations support the findings of MacDougall and Andrew. In the majority of the subjects the activity was more pronounced in the posterior fibers. As suggested by MacDougall and Andrew, the function of this activity is protective, preventing the dislocation of the jaw. The muscle, acting as an antagonist, checks further opening of the mouth.

Elevation.—

Molar occlusion: All the fibers of the muscle showed marked activity, supported the generally accepted view concerning the action of the muscle. The elevation of the mandible is the principal function of the temporalis, shared by all its parts equally.

End-to-end occlusion (incisor bite): All the parts of the muscle were active, but the activity was greater in the anterior fibers. These findings confirm the results obtained by MacDougall and Andrew but are opposed to the view held by Keith, who stated that the temporalis muscle is not active at all during end-to-end biting.

SUMMARY AND CONCLUSIONS

An electromyographic study of the temporalis muscle was done on children aged 10 to 14 years with normal dentofacial structure, using bipolar surface electrodes and the Grass Electroencephalograph.

The total number of the subjects studied was twenty-five. Results were compared, using bipolar concentric needle electrodes, surface electrodes with reference electrode on the ear lobe, and Stanley Cox special electromyograph.

The following conclusions have been drawn:

1. The temporalis muscle maintains the mandibular posture in the physiologic resting position, the posterior fibers taking a more active part than the anterior ones.

2. The temporalis is an ipsilateral abductor and a contralateral adductor of the mandible.

3. During maximal opening of the mouth, the temporalis muscle acts as an antagonist and prevents the mandibular joint from dislocation.

4. The temporalis is a very active elevator of the mandible. All the parts are maximally active during molar occlusion.

5. In end-to-end occlusion (incisor bite) the anterior fibers of the muscle are more active.

6. The muscle does not play any part in mandibular protraction.

7. Resting tonus in the muscle is decreased during protraction in a considerable number of persons.

8. The temporalis retracts the protruded jaw.

9. Placing the reference electrode far away introduces extraneous electrical interference into the records, giving wrong results.

It is a great pleasure to express my gratitude to Professor J. V. Basmajian for his supervision, interest, and assistance throughout the study and, later on, his help in the preparation of this paper. I am very thankful to Drs. R. Boyko and F. Popovich for their assistance at the Orthodontic Research Centre, Burlington, Ontario.

REFERENCES

1. Carlsoo, S.: Nervous Coordination and Mechanical Function of the Mandibular Elevators; an Electromyographic Study of the Activity, and an Anatomic Analysis of the Mechanics of the Muscles, Acta odontol. scandinav. **10**: Supp. 11, 1952.
2. Keith, A.: A Discussion of a Paper by L. H. Dudley Buxton: "The Teeth and Jaws of Savage Man," Tr. Brit. Soc. Orthodontists 1916-20, pp. 79-88, 1920.
3. MacDougall, J. D. B., and Andrew, B. L.: An Electromyographic Study of the Temporalis and Masseter Muscles, J. Anat. **87**: part 1, 1953.
4. McCollum, B. B.: Oral Diagnosis, J. Am. Dent. A. **30**: 1218-1233, 1943.
5. Moyers, R. E.: Temporomandibular Muscle Contraction Patterns in Angle Class II, Division 1 Malocclusion: An Electromyographic Analysis, AM. J. ORTHODONTICS **35**: 837, 1949.
6. Moyers, R. E.: An Electromyographic Analysis of Certain Muscles Involved in Temporomandibular Movement, AM. J. ORTHODONTICS **36**: 481, 1950.
7. Robinson, M.: The Temporomandibular Joint; Theory of Reflex Controlled Nonlever Action of the Mandible, J. Am. Dent. A. **33**: 1260-1271, 1946.

CEPHALOMETRICS IN THE ATOMIC AGE

MELVIN I. COHEN, B.S., D.M.D.,* AND ERIC HAMMOND, R.N.R.T.,**
BOSTON, MASS.

INTRODUCTION

IN A report on the "Biologic Effects of Atomic Radiation" issued by the National Academy of Sciences in Washington, the second of twelve recommendations reads as follows: "The medical use of x-rays should be reduced as much as is consistent with medical necessity." This precaution, along with the others, is the considered conclusion of 100 able scientists who had weighed all the available evidence. The major concern over excess radiation centers on the possible harmful effect of radiation-induced mutations in the gonads and the possible pathologic changes to the tissues of the body. Since radiation is known to be cumulative, then any and all sources of this radiation must be considered. The three such sources are (1) the natural background, (2) medical and dental x-rays, (3) fall-out from testing of atomic weapons. The thirty-year dose to the gonads received by the average person is described in this report as follows: (1) background, about 4.3 roentgens; (2) x-rays and fluoroscopy, about 3 roentgens; (3) weapons test, from 0.2 to 0.5 roentgen.

The many areas of inexact information and the urgent necessity for more research on these subjects are frequently admitted and pointed out in this report. However, it does seem prudent to reduce the amount of radiation to the patient to the least amount consistent with the diagnostic needs of the problem. Both Pollock[1] and Salzmann,[2] in their editorials, appear to advocate this precaution. It is the purpose of this article to describe a simple method of reducing the amount of radiation in the routine use of cephalometric radiography.

An inspection of the cephalostat at the Harvard School of Dental Medicine revealed that the emergent beam could be detected as low as the apex of the heart (Fig. 1). This apparatus utilized a 90 KVP machine with a focal film distance of 5 feet. A limiting diaphragm of 0.5 mm. aluminum was already positioned by the manufacturer. In older type machines, with no limiting diaphragm, it may be assumed that the extent of scatter to the body may be greater. The lower level of the beam was detected as follows: A fluorescent screen was secured to the posterior of the head holder. In a darkened room, the x-ray machine was turned on and the lower level of the irradiated area was marked on the screen. This marking was then transferred to the approximate level of a seated patient fixed by the head holder.

*Orthodontist, Children's Medical Center; Assistant Clinical Professor in Orthodontics, Harvard School of Dental Medicine.
**Radiographer, Children's Medical Center.

CONSTRUCTION OF LIMITING DIAPHRAGMS

The useful beam of x-rays emerging from the tube may be cut down or limited at or near the source, called a primary diaphragm (Figs. 2 and 3), or near the patient, called a secondary diaphragm (Figs. 2 and 4). The primary diaphragm has the important advantage of offering increased protection to the operator, as well as being smaller. However, it does require more accurate positioning and centering. The secondary diaphragm has to be larger, more cumbersome, and does not offer any protection to the operator.

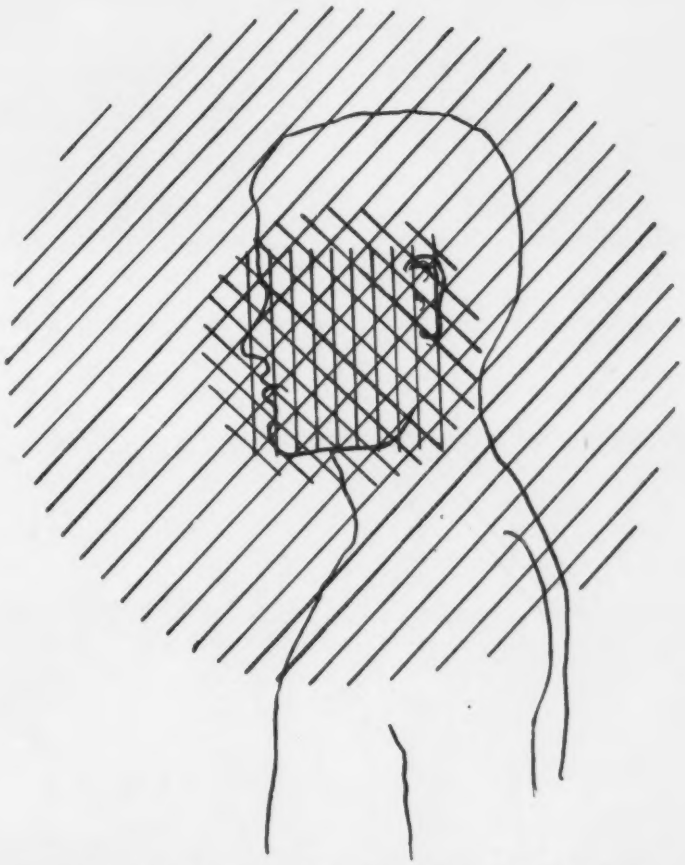


Fig. 1.—Areas of irradiation with cephalostat. Outer circle indicates unrestricted emergent beam. Inner circle approximates limitation with primary diaphragm. Perpendicular lines approximate limitation with secondary diaphragm.

A. *Construction of Primary Diaphragm.*—The material of choice is lead, preferably 2 mm. thick. At this thickness, it is effective as a primary barrier up to 120 KVP; it is easily marked and yet not too flexible. The size of the aperture necessary to limit the field of exposure may be arrived at either by calculation, if some limiter is present in the tube, or by trial and error.

Calculation: The desired area of coverage is a matter of individual decision. For routine use of cephalometrics, a rectangle approximately bounded by the soft tissue of the nose and chin anteriorly and inferiorly, the Bolton

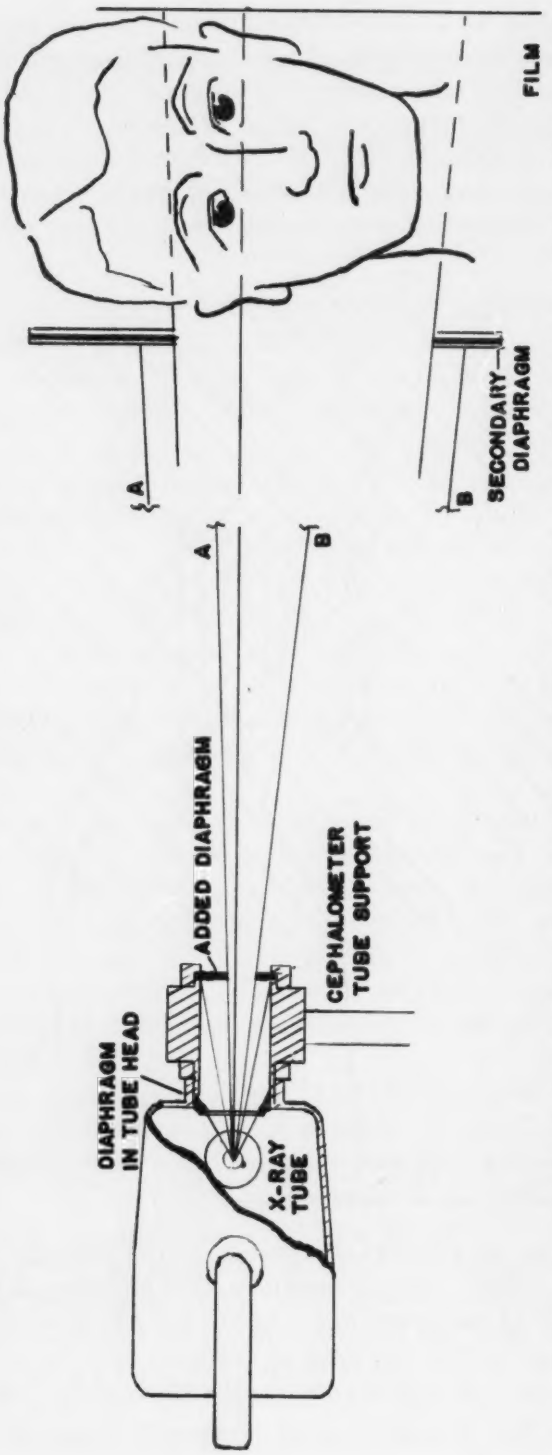
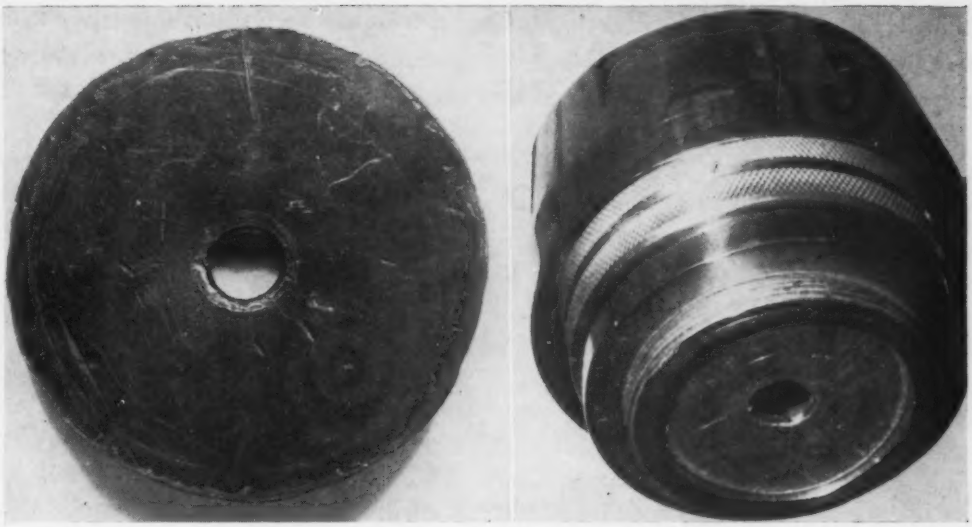
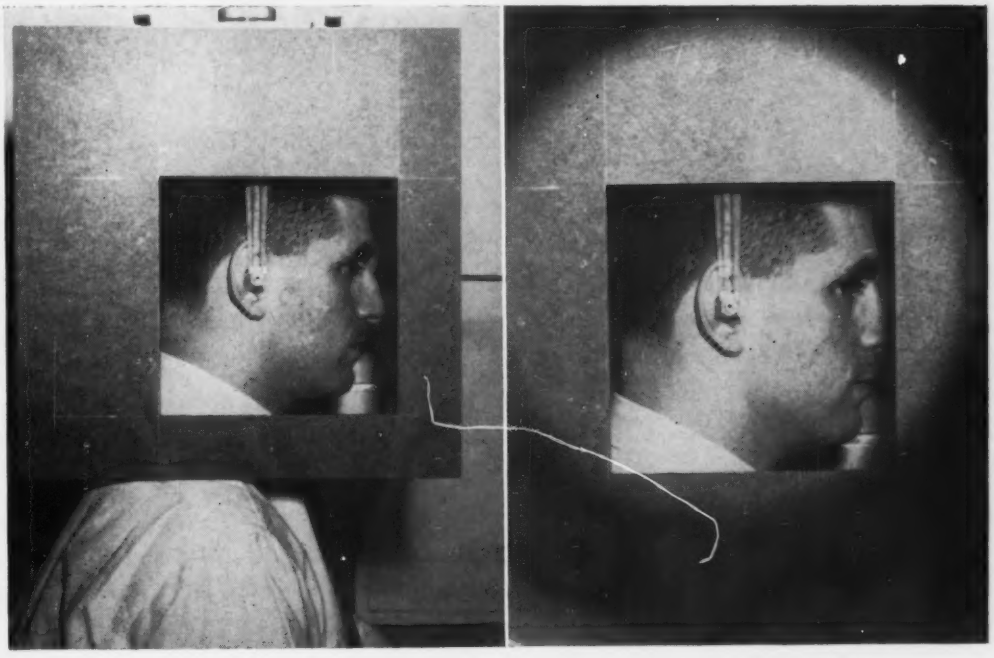


Fig. 2.—Diagram of cephalostat with primary and secondary diaphragms positioned to show the limiting effect on the emergent beam of x-rays.



A. *B.*

Fig. 3.—Photographs of primary diaphragms. *A*, Close-up of thick piece of lead 2 mm. *B*, Diaphragm in position.



A. *B.*

Fig. 4.—Secondary diaphragm. *A*, Diaphragm suspended from head positioner. *B*, Photograph taken through the lumen of the tube positioner.

point posteriorly, and about 2 inches above nasion superiorly, should be adequate (Fig. 5). While a rectangular aperture may seem desirable, it is technically difficult because of alignment. Therefore, the simple round aperture is made and the excess radiation is removed at the secondary diaphragm.

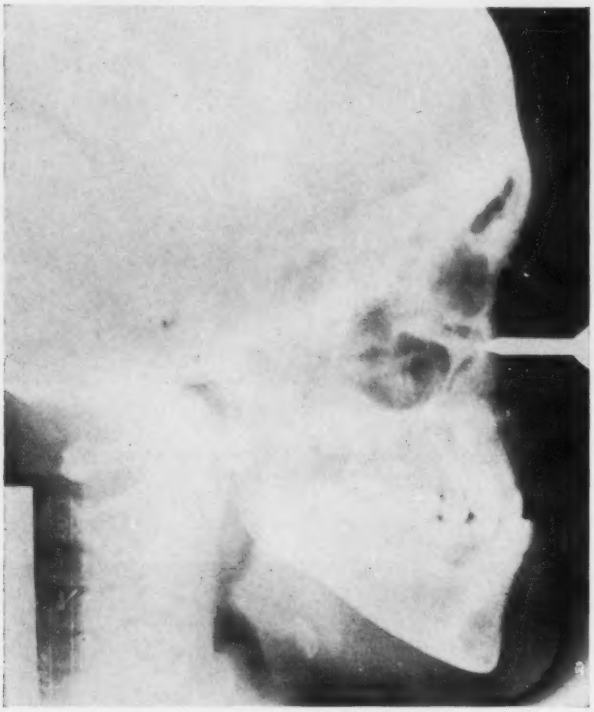


Fig. 5.—Suggested area coverage for routine use of cephalometrics.

If a lead limiting diaphragm has been already inserted by the manufacturer in the housing in front of the tube (Fig. 1) (usually where the tube is fastened to the fixator), the desired aperture in the new limiting diaphragm may be calculated by the following formula:

$$\text{New aperture} = \frac{\text{size of existing aperture} \times \text{desired area}}{\text{area of film shadow}} \quad \text{where}$$

(1) Size of existing aperture may be measured on the manufacturer's diaphragm.

(2) Desired area is established by the individual operator. However, it is usually wise to consider this a trifle smaller than an 8 by 10 field. The excess will be limited at the secondary diaphragm.

(3) Area of film shadow can be established by using a fluoroscopic screen as described above. An open 8 by 10 intensifying screen can serve a similar purpose, but much more x-ray exposure is needed.

Trial and error: Where there is no limiting diaphragm, the aperture size can best be determined by trial and error.

Cut a lead washer 2 mm. thick to accurately fit the housing attached to the fixator. A washer cutter attached to a hand drill, or a sharp knife and file, is recommended. Then, cut a hole in the center about ¼ inch in diameter. Following this, expose a film and measure the area covered by this aperture. The correct aperture for the desired area coverage can be calculated by the above formula.

B. *Secondary Diaphragm* (Fig. 3).—Lead sheeting 1 mm. thick is an adequate barrier for radiation at this distance from a dental x-ray tube (5 feet). This sheeting should be adequately secured in a suitable frame and attached to the head holder in a simple manner, such as that illustrated in Fig. 4. We secured the lead between two sheets of Masonite 3 mm. thick. A 7½ inch post was cut in a strategic position to allow for the inclusion on the film of all the pertinent structures for a routine evaluation. This size was calculated to include these structures in the larger patients.

Using the diaphragms as described, together with a General Electric unit operated at 90 KVP 15 Ma. for 0.3 second, 0.03 roentgen was measured.[3]

SUMMARY

A simple method of reducing the amount of radiation in routine cephalometry has been described.

REFERENCES

1. Pollock, H. C.: Caution and Radiation (Editorial), Am. J. Orthodontics 42: 625-627, 1956.
2. Salzmann, J. A.: Basic Etiological Factors in Dento-Facial Malformations (Editorial), Am. J. Orthodontics 42: 702-704, 1956.
3. Cowing, Russell F.: Personal communication.

PRESENTATION OF THE ALBERT H. KETCHAM MEMORIAL AWARD, 1957, BY ERNEST L. JOHNSON, PRESIDENT OF THE AMERICAN BOARD OF ORTHODONTICS

Mr. President, Dr. Oliver, Fellow Directors of the American Board of Orthodontics, Members of the American Association of Orthodontics, and guests:

The Albert H. Ketcham Memorial Award was established by the American Board of Orthodontics and the American Association of Orthodontists in 1937, to be given in recognition of notable contributions to the science and art of orthodontics. Since its inception, sixteen men have received this award, which is the highest honor our Society can bestow upon one of its members. Today we are gathered to honor and pay tribute to Dr. Oren Austin Oliver, the 1957 recipient.

Dr. Oliver has always been a dynamic force in our profession. His writings and teachings of one of our accepted appliance therapies are known throughout the world. He was born in Craig County, Virginia, in 1887, where he received his primary schooling. Subsequently, he attended the Lynchburg College in Lynchburg, Virginia, in 1904 and 1905, the Medical and Dental College in Richmond, Virginia, in 1906 and 1907, taking his final year at the Atlanta Dental and Medical School (now Emory University), from which he was graduated in 1909. For the next six years he practiced general dentistry in Newcastle and Covington, Virginia, where he married Floy Huntley, to whom a great deal of credit must be given for her unselfish devotion to Oren's career. Senator Revercomb told Bill Jarrett that all that he could remember about Oren at that time was that he joined every organization in town, was a great dancer, attended every dance that was held, married the prettiest girl in town, and left for Tennessee. The Olivers have been blessed with one daughter, three sons, and eight grandchildren. Pampering his grandchildren, especially at Christmas time, is one of Oren's weaknesses. One of his sons, William, elected to follow in his father's footsteps and is now making his own name in orthodontics.

In 1916 Dr. Oliver was persuaded by his old friend, Dr. Jo Eby, to attend the Dewey School of Orthodontics. (Jo and Oren had met each other in school, while playing baseball on opposing teams.) Upon completion of the course, Dr. Oliver started orthodontic practice in Nashville, Tennessee. From the beginning, he took an active part in local, state, and national dental association work. While a member of the Board of Trustees of the American Dental Association, he served on twelve committees, was chairman of five, and in 1941 served as president of the American Dental Association.

Presented at the fifty-third annual meeting of the American Association of Orthodontists, New Orleans, Louisiana, May 17, 1957.

The Department of State in 1936 designated Dr. Oliver as a delegate to the ninth International Dental Congress in Vienna. In 1955 he represented the American Dental Association at a luncheon given by President Eisenhower at the White House for Korean Relief.

In orthodontics, Dr. Oliver has always given unstintingly of his time and energy. He served six years as secretary of the Southern Society of Orthodontics and as its president in 1924. Dr. Oliver also had the privilege of serving as president-elect under Dr. Ketcham at the American Association of Orthodontists meeting in Estes Park in 1929; he served as president of the American Association of Orthodontists the following year.

When the American Board of Orthodontics was founded, Dr. Oliver was one of the original directors, serving as secretary from 1929 to 1936 and as president in 1937.

His editorial activities have been many. He has served as the first editor of the *Journal of the Tennessee State Dental Association,* associate editor of the AMERICAN JOURNAL OF ORTHODONTICS, counsellor of the *Journal of Dental Research,* co-editor of the *Orthodontic Directory of the World,* and co-author of the textbook *Labio-Lingual Technic.* As an essayist and clinician, he has appeared on the programs of numerous state and national dental organizations, here as well as in England, Holland, France, and Mexico. We find ninety-eight articles by him which have been published in scientific journals at home and abroad. The number of unpublished papers given can only be surmised.

During World War I Dr. Oliver served as a first lieutenant in the Army Dental Corps, joining the reserve in 1917. During World War II he took an active part in procurement and assignment and war manpower. In 1956 he was recommissioned a lieutenant colonel in the Dental Reserve. He also served as a colonel on the staff of four different governors and as chief of staff of former Governor Hill McAllister of Tennessee with the rank of brigadier general.

As a teacher, Dr. Oliver has been in great demand and has been an inspiration to many young men entering orthodontics. In fact, few men have had as much influence directly and indirectly on the future of as many young men in dentistry. He served as instructor, professor, and vice-president of the Dewey School of Orthodontics from 1916 to 1926. He was also professor of orthodontics and a member of the Executive Council at Vanderbilt University School of Dentistry, visiting professor of orthodontics at the University of Kansas City Dental School, lecturer at the Graduate School of Orthodontics, Tufts College Dental School, and director of a postgraduate course in labial-lingual technique at Washington University Dental School.

Many honors have been conferred upon Dr. Oliver. Only last month the Lynchburg College of Lynchburg, Virginia, presented him with their Thomas Gibson Hobbs Award and Citation. Certificates of award have been presented to him by fourteen organizations in the United States, and he has received certificates of recognition from eleven foreign orders.

He is a Fellow and past president of the International College of Dentists, a Fellow of the American Society for the Advancement of General Anesthesia

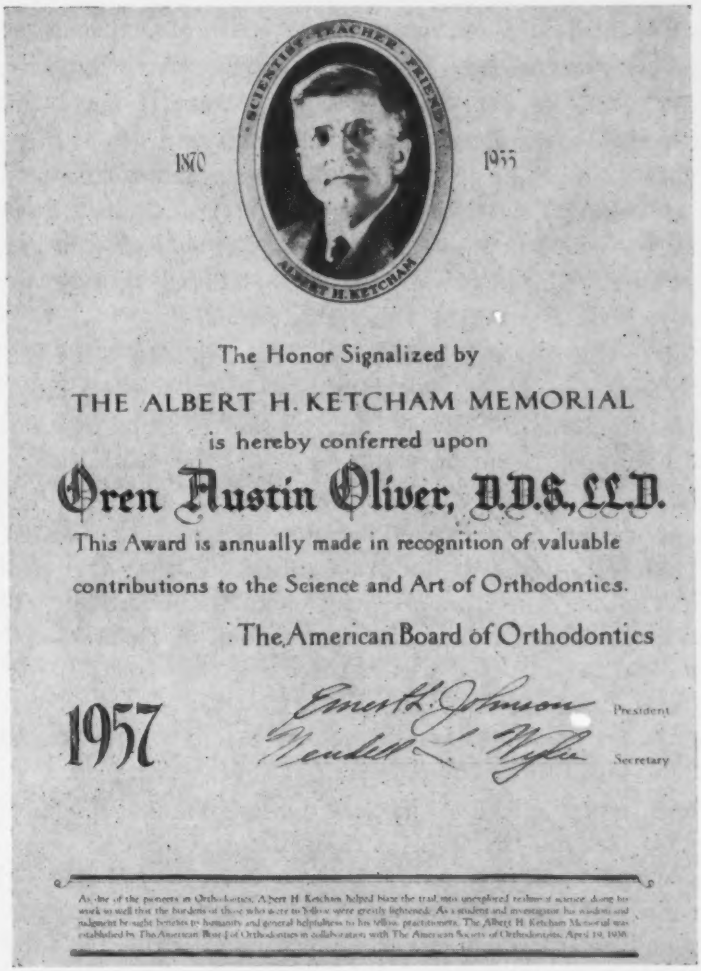
in Dentistry, a Fellow of the American College of Dentists, a Fellow of the American Association for the Advancement of Science, and past president of the Federation Dentaire Internationale, to mention but a few. His fraternal memberships include Psi Omega, dental; Phi Kappa Sigma, literary; Phi Chi, medical; Omicrom Kappa Upsilon, honorary dental; Pi Gamma Mu, honorary literary.

OREN A. OLIVER

Besides all the foregoing activities, Dr. Oliver has found time for civic affairs, and has served as president of the Shrine Club, potentate of the Al Memah Temple, president of the Nashville Auto Club, vice-president of the Board of Tennessee State Speech and Hearing Association, director of the Royal Order of Jesters, member of the Rotary Club, Elks Club, Belle Mead Country Club, and deacon and elder of the First Presbyterian Church of Nashville. Since 1944 he has been chairman of the State Public Health Council. This Council is the group that sets the policy and regulations for the entire State Department of Public Health of Tennessee.

With all of Dr. Oliver's activities, it is little wonder that he has neglected his favorite sports of golf and deep-sea fishing. However, Bill advises me that his father has taken up golf again after fifteen years and is enjoying it thoroughly. His fishing pal, Jeff Lunsford, writes: "Oren was careful to send

me to Miami where the weather is warm, in order that I could take care of him in his old and crabby years, and he was also smart enough to send McFall to the cool mountains of North Carolina where he will have a nice place to spend his summers. I feel if nothing happens, Mac and I will be able to weather the storm when it comes.'' This record of achievement shows that in Oren A. Oliver we have a man who, by his perseverance, talent, and willingness to serve, has been an outstanding benefactor to the public, the profession of dentistry, and the specialty of orthodontics.



THE KETCHAM AWARD

Now, by virtue of the power vested in me by the American Board of Orthodontics and the American Association of Orthodontists, it is my very great pleasure and honor to bestow upon you, Oren A. Oliver, the Albert H. Ketcham Memorial Award for the year 1957.

RESPONSE BY OREN A. OLIVER TO THE PRESENTATION OF THE ALBERT H. KETCHAM MEMORIAL AWARD

Mr. President, Dr. Johnson, Fellow Directors of the American Board of Orthodontics, Members of the American Association of Orthodontists, and guests:

I am deeply grateful for the honor which you have bestowed upon me by the presentation of the Albert H. Ketcham Award. I am fully conscious of the fact that in the ranks of our profession there are many eminent men of ability, vision, and high devotion to duty who are as well qualified for this distinction as I am. This fact, however, merely adds to the esteem which I place on this material symbol of your devotion to me as well as the faith and confidence you have placed in me. I trust that I shall live up to your expectations and prove myself worthy of this signal honor.

I appreciate the fact that with such recognition as you have accorded me there also comes increased responsibility. By accepting this award I am charged with the obligation of carrying on the tradition, the inspiration, and the vision of him in whose memory this memorial was established.

It was my good fortune to know Dr. Albert H. Ketcham personally. For many years he was my close personal friend. For six years we served together on the first American Board of Orthodontics. I was privileged to serve as president-elect of the American Association of Orthodontists when he was its president and in 1930 to succeed him as president of the Association. In these years of our close association I was inspired and impressed by his industry, his broad understanding, his vision, and his unselfish devotion to duty. These valued associations with so great a pioneer in our profession add additional significance and meaning to the receiving of this award.

It has been my privilege to practice dentistry and orthodontics for almost half a century. During that long period of time I have seen many important changes in the social and economic life of the American people. These changes have taken place so quietly that many of us are hardly aware of what has taken place, and yet these changes have profoundly affected the lives of all of us. I want to call your attention to only a few of them because of their implications for our profession.

When I attended elementary school in Virginia the population of the United States was only 76,000,000. Today we have a population of more than 168,000,000. This simple fact alone points to the great demand for more dental service. In 1940 there were 70,601 dentists in the United States; in 1956, however, the Bureau of Census listed 97,529. Thus, we have an increase of 27,000 in a period of only sixteen years.

In 1890 there were only 500,000 students attending high schools in the United States. Today there are more than 7 million. Increased educational opportunity has added to the demand for more and better health service. The first World War made the American people conscious of the importance of dental health to general health. World War II added emphasis to this fact when the public was informed that, among the first 3 million Selective Service registrants, tooth defects accounted for 16.5 per cent of all rejections. The importance of our profession is now generally recognized by the American people. Dental health is now included in all health discussions. Dental health education programs have been initiated. Dental examinations have been added to health programs, and dental health services are being added in state and local health units.

The American people today are willing to spend more and more money for health services. The total amount so spent rose from 2 billion in 1933 to 9 billion by 1951. The rate of increase, it seems to me, is especially significant.

Scientific research and the discovery of miracle drugs and medicines, together with improved sanitation, have added twenty years to the average life of Americans in the past half-century.

In our own specialty, also, many important advances have been made during the same period. I will not take time to enumerate them because they are known to you. Many of our number have been responsible for these advances. Some of our members have been, and still are, engaged in research and writing so that today we have a rich storehouse of published information in our books and professional journals.

Substantial dental libraries are now available to us. We have strong and growing local, sectional, national, and international dental and orthodontic organizations. But let us not be satisfied to rest on our laurels and become too complacent as we look back over our record of splendid achievement; rather, let us look to the future and, in the spirit of Dr. Albert H. Ketcham, continue to work for still higher standards of attainment. Our work really has only begun; we must look forward to greater heights to climb. Let us remember that without vision the people perish. We are now in an era of great opportunity for further advancement and more glorious achievements. We are living in the atomic age and, along with atomic bombs, we also have atoms for peace. Research workers in our specialty no doubt will explore new frontiers in this dawn of a modern era.

It is my hope that the force which inspired the labors of Dr. Ketcham will move others in our profession to take up the torch and carry it forward with the same zeal, industry, and vision and reach even greater heights of achievement in the years to come.

Editorials

PATIENT TRANSFER: ROUND-TABLE DISCUSSION AT NEW ORLEANS

ONE of the features of the 1957 meeting of the American Association of Orthodontists in New Orleans was the round-table luncheon, in which more than 300 orthodontists from Maine to California, Canada, and Mexico participated.

Each table was presided over by a moderator appointed by the Program Committee. The moderator was assigned an interesting subject to be taken up in a panel discussion at his particular table. If you desired a place at a table, you picked the subject and table (in advance) and, if it was not filled, you were assigned to the table of your choice.

An editor of an orthodontics journal would naturally try to choose a subject or subjects in which he felt the readers were most interested and one which he considered important to the welfare and future of the specialty. There can be little doubt that the subject of greatest importance in orthodontics at this time is public relations. Within the general area of public relations, probably the one thing causing more concern than any other is the problem of patient transfer. This subject is dangerous to public relations for the specialty and for the public because so often transfer of patients results in confusion and misunderstanding.

This subject was assigned to table No. 53 and the moderator appointed to preside over that table was Dr. W. R. Alstadt, president-elect of the American Dental Association. It is presumed that one reason at least that Dr. Alstadt was appointed to lead this discussion was his wide experience and knowledge of the A.D.A. routines and its attitude toward the specialties of dentistry and the resultant problems of specialty segregation that reflect on the mother profession. Dr. Alstadt's approach to the subject reflected the over-all public relations attitude of the entire dental profession. The subject of the transfer of *orthodontic* patients is undoubtedly accentuated because patients are usually treated over many months and because practically all orthodontists have their individual preferences particularly with regard to the merits of various and sundry mechanical routines used to correct malocclusion of the teeth.

Several impressions were gained from the discussion emanating from this group of orthodontists from widely scattered geographic locations in the United

States. Some expressed views that were plainly constructive for both patients and doctors. A few of these ideas follows:

1. The transfer of orthodontic patients should be handled with meticulous care, caution, and common sense, as the entire process is loaded with potential trouble for all concerned. In no department of practice should ethics as set forth in the Golden Rule be adhered to more religiously. The impression is gained that much of the difficulty results in the basic concept of the doctor-patient consultation teamwork being taken too much for granted.

2. The transfer may be done on the traditional doctor-to-doctor consultation basis. That is, the one transferring the case may write or telephone in consultation with the one to whom he refers the case, thereby creating a cordial constructive professional meeting of minds on the continuation of the case for the very best interest of the patient. This procedure is in accord with the tenets prescribed by the medical and dental profession and exemplified in the Oath of Hippocrates; no doubt, if adhered to, it holds much of the answer to the entire problem.

3. On the other hand, a transfer may be approached on an indifferent catch-as-catch-can basis without careful three-way consultation. The doctor-to-doctor consultation plan usually works out very satisfactorily, whereas the latter rarely works out happily for the patient and the two doctors.

4. Teachers, leaders, workers, and editors everywhere should lose no time in indoctrinating all collectively with the fact that each person involved in the transfer of patients has an important obligation and that the transfer should be accomplished in a dignified doctor-to-doctor consultation atmosphere by correspondence, by telephone, person to person, or all three.

Other important points also were made. For instance, it was thought that when a patient is transferred there should be a follow-through on the part of specialist No. 1 to see that his patient is properly in the hands of a man who wants to serve the patient and who will take the case and carry on with good will and cooperation.

Having just read again the profile of Martin Dewey, which appeared in the May issue of the JOURNAL, I wondered in retrospect why we hear so much more about the subject of patient transferral now than in former years when Dewey was editor of the JOURNAL. It was indeed surprising, then, to turn up a ten-page editorial on this same subject by Martin Dewey, published in 1918, thirty-nine years ago, in volume 4 of the INTERNATIONAL JOURNAL OF ORTHODONTIA, and read what he had to say.

The length of that editorial and the detail discussed therein, in themselves, reveal that there must have been lots of misunderstanding on the subject, even back in the days of World War I. The points made in the editorial which

Dewey wrote so many years ago were twofold: (1) that the patient must come first and (2) that the doctor-patient relationship was often being replaced by what might be called, for want of a better name, "a mechanized prejudice on the part of most orthodontists of that period."

The main trouble, after all, seems to be that there is much in orthodontics, by the very nature of our specialty, that makes for mechanistic thinking and wide divergence of mechanistic methods, notwithstanding that there is no problem which ordinary courtesy and the basic tenets as set forth in the Oath of Hippocrates cannot very easily solve.

Such were the impressions that might have been received by anyone who listened to the round-table discussion on the question of transferral of cases at the annual meeting of the American Association of Orthodontists in New Orleans in May, 1957.

H. C. P.

HISTORY OF THE ALBERT H. KETCHAM AWARD

THE contributions of Dr. Albert H. Ketcham to the art and science of orthodontics will live on as a memorial to his memory. The motto "service before self" was never better exemplified. His life was dedicated to the promotion of human welfare through the advancement and perfection of the orthodontic specialty. His death on Dec. 6, 1935, was a great loss not only to his many personal friends, but also to the orthodontic specialty which lost one of its most dedicated and hardest workers of all time; however, his influence lives on.

To honor the memory of this great leader, to perpetuate his contributions, and to stimulate further research in his chosen field of endeavor, the American Board of Orthodontics, in collaboration with the American Association of Orthodontics, in 1936 established the Albert H. Ketcham Memorial.

Because of his broad understanding, his unselfish devotion to duty, and the high goal of attainment he set for himself and for his fellow specialists, Dr. Ketcham's place in our specialty stands high in the annals of human endeavor and successful achievement. No man ever gave more generously of his time, effort, and ability for the achievement of the specialty than did Dr. Ketcham. Handicapped as he was for forty years by many disabilities, he never faltered in his exacting labor, nor did his interest lag. He was devoted to research designed to increase the skill and understanding needed to improve his specialty and thereby contribute to the health and happiness of mankind.

The high esteem in which he was held by his colleagues is attested by the fact that he was elected the first president of the American Board of Orthodontics. He held this position from the inception of the Board in 1929 and continued as a member of the Board until his death. Prior to this recognition, he had been honored by election to the office of president of the American

Association of Orthodontists. His vision, industry, wide experience, enthusiasm, and mature judgment and counsel did much to make the work of the Board a success.

The following quotation is taken from the minutes of the American Association of Orthodontists:

To commemorate Dr. Ketcham's splendid achievements, and better still to prove an inspiration to the advancement of orthodontics, it is now proposed to set up a permanent memorial to be known as the "Albert H. Ketcham Medal," this medal to be awarded annually to an orthodontist or other scientist who, in the judgment of the award committee, has made an outstanding contribution to the science and art of orthodontics during the then current year or during some previous year. The award committee will consist of three members of the American Board of Orthodontia and two members of the American Society of Orthodontists. A fund is accordingly being sought which, when invested in ultraconservative securities, will yield a sufficient sum of money to defray the annual cost of the medal. It is believed that all orthodontists will consider it a privilege to have a part in this memorial. Contributions may be sent to Dr. Charles R. Baker, 636 Church St., Evanston, Illinois.

Oren A. Oliver
B. Frank Gray
Charles R. Baker
Committee.

An item pertaining to the Ketcham Award was published subsequently in the AMERICAN JOURNAL OF ORTHODONTICS, at which time Editor H. C. Pollock mentioned the fact that the American Board of Orthodontics would establish a permanent memorial to be known as the Albert H. Ketcham Medal, to be awarded annually to the orthodontist or other scientist, who makes an outstanding contribution to the science and art of orthodontics. At the time of going to press, it was said that such a movement had been started and that information might be secured from B. Frank Gray, 450 Sutter St., San Francisco, California, or Oren A. Oliver of Nashville, Tennessee.

Dr. B. Frank Gray possibly had more to do with setting up the Ketcham Award that did any other person; however, the entire American Board of Orthodontics must be given credit for setting up this award during 1935 and 1936. It might be said that the start came from Dr. B. Frank Gray, Dr. Charles R. Baker, and possibly other men who had suggested the same to Dr. Gray; however, credit must be given to Dr. Gray as originator. At the meeting of the American Association of Orthodontists, held in St. Louis, April 20 to 23, 1936, the report of the American Board of Orthodontics had this to say:

To commemorate the splendid achievements of our late President, Dr. Albert H. Ketcham, and to serve as an inspiration to the advancement of orthodontics, the American Board of Orthodontia has created

The Albert H. Ketcham Memorial.

The material symbol of this Memorial shall consist of an illuminated parchment, appropriately inscribed, the same to be awarded annually (in perpetuity) to some orthodontist or other person who, in the judgment of the Award Committee, has made a notable contribution to the Science and Art of Orthodontics during the then current year or during some previous year.

The Award Committee shall consist of five members, namely, the President, the President-elect, and the Vice-President of the American Society of Orthodontists, the remaining two members to be appointed annually by the American Board of Orthodontics.

To defray the expense involved in the preparation and administration of this memorial, contributions are being received from the orthodontists of the United States and other countries. The aggregate sum so received shall be invested in high-grade securities or in an interest-bearing savings account, such investment to have the unanimous approval of the American Board of Orthodontics. Subscriptions may be sent to the Secretary of the Board.

Oren A. Oliver
President
American Board of Orthodontics.

At the meeting of the American Association of Orthodontists, held in Chicago, Illinois, 1937, the first presentation of the Albert H. Ketcham Award, at the thirty-fifth annual session, was made by Dr. Frederic T. Murlless to Dr. John V. Mershon. The presentation by Dr. Murlless was very impressive and, in presenting this memorial, he gave a brief outline of our beloved Dr. Ketcham and the biographical survey of John Valentine Mershon. Dr. Mershon's remarks in accepting the award were: "Dr. Ketcham has passed to the Great Beyond but he still lives in our hearts. Words are used to express ideas, but on this occasion they cannot convey one's feelings. If I have done anything or given anything for the children of the world which would entitle me to this honor, I can only say that it was a gift of God which I was permitted to administer."

In 1938 B. Frank Gray, president of the American Board of Orthodontics, presented the award to Alfred P. Rogers of Boston, Massachusetts. Remarks were also made by Dr. Frank M. Casto, B. Frank Gray's successor as president of the American Board of Orthodontics. The remarks in accepting the Award were very brief but of great significance.

From that time up to the present, the Ketcham Award has been presented to the following seventeen outstanding members for their contributions to orthodontics:

1937 John Valentine Mershon*
1938 Alfred Paul Rogers
1939 Milo Hellman*
1940 George Wellington Grieve*
1941 Frederick B. Noyes
1942 Harry E. Kelsey*
1944 B. Holly Broadbent
1946 Raymond Clair Willett*
1948 Clinton C. Howard*
1949 William K. Gregory
1951 Benno E. Lischer
1952 James David McCoy
1953 Spencer R. Atkinson
1954 Charles Reeder Baker
1955 Joseph E. Johnson
1956 Leuman M. Waugh
1957 Oren A. Oliver

O. A. O.

*Deceased.

The Fifty-third Annual Meeting of the American Association of Orthodontists

THE GOLDEN ANNIVERSARY LUNCHEON OF THE AMERICAN ASSOCIATION OF ORTHODONTISTS NEW ORLEANS, LOUISIANA MAY 13, 1957

THE luncheon honoring those orthodontists who have been in practice for fifty years or more has become one of the most outstanding features on the program of the A.A.O. This annual luncheon has been held for the past five years and the attendance has always been most gratifying. This year approximately 300 persons attended.

Dr. Charles R. Baker was again in charge of the arrangements and he showed some most interesting photographs of several members of the Golden Anniversary Group, from babyhood to adulthood. In his annual report Dr. Baker stated: "There is complete harmony and cordiality among the members of the Golden Anniversary Group, and we keenly appreciate being recognized and honored each year by the members of the American Association of Orthodontists." He then read some excerpts from a few of the letters he had received from those members who were unable to attend the luncheon. The following are typical of the sentiments expressed:

Mrs. Albert E. Voss wrote: "Albert was very proud of his membership in the Golden Anniversary Group, and of his gold pin, sent to him as a member. I hope all members of this fine group may enjoy a long membership."

Earl W. Swinehart wrote: "Please extend my sincere congratulations to those who this year have reached their fiftieth milestone of dental practice. Mere attainment of such an unusual term of service is noteworthy in itself, but when it is realized that throughout this half-century these men have continued to be outstanding for their ability and contributions to the advancement of dentistry, our thankfulness and best wishes pour out to them. May they be encouraged to look upon this as just another successful day lighted by the hope for still better and more productive ones to come."

Everyone was happy to hear that Alfred Rogers is improving since his recent hospitalization.

The master of ceremonies was Dr. William B. Stevenson, Sr., vice-president of the A.A.O., who introduced those seated at the head table.

The new members who had completed fifty years in dental practice were William E. Flesher, Oklahoma City, Oklahoma; Samuel J. Lewis, Kalamazoo,

Michigan; Harvey Carlyle Pollock, Sr., Clayton, Missouri; and Leonard T. Walsh, Pueblo, Colorado. There is now a total of forty-six members in this group.

Two other of our well-known orthodontists—Homer B. Robison of Great Bend, Kansas, and Carl O. Engstrom of Sacramento, California—would also have become members this year had their lives not ended just before they completed their full fifty years in practice.

The Golden Anniversary Group lost five very beloved members during the past year, namely, Harold M. Clapp, Ralph T. Huff, Norris C. Leonard, Arthur B. Thompson, and C. M. McCauley. It is gratifying to know that they were all able to be members and to enjoy the fellowship of this group for several years.

Those attending the luncheon were greatly honored by having Dr. Joseph D. Eby give such an inspiring talk on "Days of Achievement." This included the days of achievement in dentistry and in orthodontics, his axioms of achievement, his thoughts with regard to preceptorships, the growth and destiny of orthodontics, and finally his prophecy and predictions concerning the future of orthodontics. (Next year Dr. Eby will become eligible to join this great Golden Anniversary Group of men who have served their profession so long and so well. We all take our hats off to them and to Dr. Eby!)

It is now my pleasure to enter into this report the entire text of Dr. Eby's excellent talk.

Lowrie J. Porter.

DAYS OF ACHIEVEMENT

JOSEPH D. EBY, NEW YORK, N. Y.

PRELUDE

When the invitation was so cordially extended to me last January to participate in this wonderful program, my heart responded with such a quickened beat that I have not fully recovered from it yet. Suffice it to express my gratitude to those very dear friends of life's long and happy trails, Charlie Baker, Andy Jackson, and Jake Gorman, for the gracious honor and privilege which this long-looked-forward-to and sparkling occasion thus now bestows on me.

We are assembled here at this time to express our gratitude and pay our most reverent homage to these beloved friends, our illustrious colleagues who have qualified for this occasion, in the full recognition of their amazing achievements. Both individually and collectively, they have made innumerable contributions to the progress of orthodontics. Through their years of earnest toil and endeavor during the evolutionary periods of the first half-century of our specialty, they and their predecessors laid the foundation on which the future of orthodontics will be built. These men whom you behold at this table today have produced many of the steppingstones which highlight orthodontic history, and it is significantly notable that they have been blessed with the health,

vigor, inspiration, and indomitable will to do the things which have been essential to their successes. Let us pray that Almighty God, in His wisdom, will further dedicate them to many more years that they may reap the dividends so justly earned. This recalls a statement made by the beloved Dr. Edmund Noyes (Fred's father and Harold's grandfather) many years ago as the honor guest at an annual testimonial dinner of the Chicago Midwinter Clinic, the analogy of which here would be: "So much have they done for us—so little can we do for them."

Leon Trice Photography.

Golden Anniversary Group, New Orleans, 1957. *Upper row:* Joseph D. Eby, speaker; Andrew F. Jackson; W. B. Stevenson, presiding; H. C. Pollock, Sr.; R. H. W. Strang. *Lower row:* Samuel J. Lewis; William E. Flesher; Charles R. Baker; Jacob A. Gorman.

With these same impulses my thoughts have raced back over innumerable events and memories of the early days of my career spent in Atlanta, Georgia, my native Southland. During those years of liberal education and experience it became my privilege to make many trips throughout the Southern states, from Virginia to Texas and Oklahoma, attending state society meetings as a guest or frequently representing our college in Atlanta. From these experiences it became my heritage to know and respect the dentists and dentistry concurrent with that period throughout the entire South. To have been close to all of these high-charactered personalities, whose names still remain legendary in their respective states, served to form one of the most enriching and broadening chapters of my professional life.

In order to partially account for my presence here today it seems necessary, with your indulgence, to mention some of the connecting links which

have occurred in my own life. My childhood was spent in the small community of Nevada in southwest Missouri, not far from Kansas, in what is known as the Missouri-Kansas border country. So I was born a son of the black soil of the Middle West. In the spring of 1903 my mother and I moved to Atlanta, where I was given my education and start in life by a very devoted uncle and aunt. They were friends of the famous Dr. Thomas P. Hinman, whose office I entered June 26, 1903, on a three-year apprenticeship. My love and affection for him soon became boundless, and our feelings were so mutual that I became known among his friends as "Dr. Hinman's boy," and in this new-found world those early formative years supplied the inspiration which has followed me to this day. My association with Dr. Hinman lasted for fourteen happy years, and so I became an adopted son of the red clay hills of Georgia.

Then followed a tour of duty in the Army, from September, 1917, to December, 1921, spent largely in maxillofacial surgery; then fate took another turn, bringing me to New York City to continue my professional career as a transplanted "Georgia cracker." The most priceless blessings of all these varied experiences have been all the wonderful friendships acquired and cherished throughout the changing years.

It is only fitting that the very spirit of this occasion should emanate within the atmosphere of this beautiful city of New Orleans, the Crescent City of the South—New Orleans, so rich in history, tradition, conquest, valor, romance, and culture, a leading seaport, one of America's great strategic cities, the Sponsor of the Delta, the Guardian of the Mississippi, and a veritable Mecca for sight-seeing.

Speaking for those of us who live north and west of the Cotton States, may we extend our hearty greetings and appreciation to all these effervescent Southerners for their cordial hospitality as our genial hosts. Correspondingly, may all of us who are Southerners extend our most gracious welcome to those of you who are our guests, in the belief that you will all have a wonderful time and leave here with long-lingering memories of this romantic atmosphere, as well as the enjoyment and benefits of one of our most pleasant and profitable meetings among this great host of friends.

DAYS OF ACHIEVEMENT IN DENTISTRY

With this prelude dedicated to our beloved Golden Anniversary men, a glimpse into the days of achievement in dentistry generally may also present an interesting background to orthodontics, our principal concern.

It is my belief that the years from 1900 to 1915 went far to lay the foundations upon which modern progress in all branches of dentistry has been so consistently developed. While every one of your native states claimed with pride outstanding dentists and superlative dentistry during that period, the situation right here in New Orleans was a most significant illustration from which to draw several interesting observations.

There were the brilliant C. Edmund Kells, John Woodward, his son Joe, and Sam McAfee, who graduated in Atlanta, all of whom I knew well. Sam

McAfee was associated with Dr. Kells in practice; he was George Crozat's professor of operative dentistry at Tulane University Dental School, and later joined the faculty at Loyola. There were many prominent dentists of that period whom our New Orleans members here today could well recall, including Jules Sarrazin, Joseph Bauer, Edward and Louis Ducasse, Rollo Knapp, and others.

Upon requesting information from George Crozat in order to confirm my own impressions of these early days, his reply was as follows: "Your concept of New Orleans' dentistry in the early era is truly correct. I agree that the cultural level of the patients did make demands upon the profession which contributed to these pioneers exerting themselves far and above the average."

After the discovery of x-ray by Roentgen in 1895, Dr. Kells began the practical application of the x-ray as a means of revealing anatomic and pathologic conditions of the teeth and jawbones in 1896. About 1925, during his declining years, he became an avid writer and published an interesting volume entitled *Three Score Years and Nine.* In this volume, largely confined to his own experiences, as I recall reading it, Dr. Kells advocated the sponsorship of infants' teeth at 3 years of age in order to protect the primary dentition from the ingress of secondary diseases and especially to avoid the damaging influences of future orthodontic complications.

Following closely, my own preceptor, Dr. Hinman, installed his first x-ray equipment in Atlanta in 1901, so history records that these two pioneers, both dentists, were the first to bring x-ray facilities south of the Mason-Dixon Line. The equipment was massive and dangerous in every way. The huge induction coils could shoot a 20 inch arc between the spark gaps. The interruptors, electrolytic or mercury turbines, were complicated and dangerous; the high-tension wires led to 8, 10, and 12 inch gas tubes, constantly with too high or too low vacuum and utterly unprotected so that every person within reach was fully irradiated. External radiographs were made by that part of the patient's body resting directly on a glass plate in a double paper envelope and required from thirty seconds to one minute of exposure. Intraoral films originally devised by Dr. Kells were made from cut camera film, 1 by 1⅛ inches, wrapped in black paper and nonvulcanizable rubber, and required an average of sixteen seconds' exposure. Fancy making an intradental survey such as we do today!

In 1900 contoured cohesive gold restorations were a highly developed art, and they were followed by silicate cement with matching colors, but these were unstable and contained irritating traces of arsenic. Gold inlays were made by filling a burnished ³⁄₁₀₀₀ 24 k matrix with solder, and the porcelain-baking technique was crude and inefficient. The cohesive diehards claimed that gold or porcelain inlays were nothing more than a piece of gold or porcelain on top of a cement filling!

The frequent extirpation of pulps, made necessary to prepare for shell crowns or pin teeth, was accomplished by the use of arsenic fiber or cocaine pressure. The local anesthetic used mostly in extractions was beta eucaine, injected with a simple syringe and often "souped up" with a touch of cocaine,

though toxic, to help matters out a little. All materials had to be prepared, *not* bought! Teeth with discharging sinuses were allowed to drain, and so-called pyorrhetic teeth were tied in until they fell out. Thus, a mouth could reek with pathology and sepsis. In 1907 Dr. William H. Taggert of Chicago first presented to the dental profession his development of casting gold by the disappearing method of the wax pattern. This advent was the initial step in the revolution of restorative dentistry.

As one great mark of achievement, our own beloved Leuman M. Waugh as early as 1909 began the development of a dental x-ray unit which was much safer and more practical for dental office purposes. He sought the collaboration of Dr. Frank T. Van Woert of Brooklyn, who was also a great friend and collaborator of Drs. Kells and Hinman. Leuman Waugh's research stages were conducted by the firm of Waite and Bartlett, who in 1914 produced the first authentic dental radiographic unit, better known as the Waugh Radiographic Unit.

In 1911, at the Chicago Midwinter Clinic, Dr. Charles Mayo read his famous paper entitled "The Oral Cavity as a Portal of Infection." He literally blasted the dental profession for the toleration of chronic and transmissible pathogenic diseases which led to advanced secondary diseases, often fatal. This brought about another revolution in dentistry and caused it to become more closely aligned with the medical profession in such conditions requiring the physical diagnosis of the dental-oral area as a primary focus for secondary organic disturbances.

In 1912 a German dentist named Reithmeuller introduced Novocain and the Fischer high-pressure syringe to America. This brought about the revolutionary advance in conductive and infiltrative anesthesia in dentistry which is such a great boon to humanity today. There were, at that time, many other advances in dental science and art which contributed to the improvement of all the various branches of dentistry.

In 1915 it was the same Dr. Charles Mayo who made the statement to Dr. C. V. Mosby that there was a young but growing branch of dentistry known as "orthodontia" that was destined to become one of the great branches of *preventive medicine*. This statement inspired Dr. Mosby to produce our orthodontics JOURNAL, which has achieved its long survival and present standing largely through the wisdom and steady guiding hand of our editor-in-chief, Dr. Pollock, who is here today.

DAYS OF ACHIEVEMENT IN ORTHODONTICS

Let us now take a fair and unbiased look at the days of achievement in orthodontics. Let us make a factual appraisal of the past and review the events which have led up to our present status. In order to contemplate those unpredictable forces which control the "passing show" and the changing scenes of time, certain criteria must be drawn from the events of the past to serve as a guide for the future. This must include certain evolutionary and current pressures within orthodontics itself, which is apparently in a state of transition in diverse directions.

The future at which we gaze also includes several other external forces which must be regarded with serious caution. There are the demands of the ever-broadening and constantly changing social and economic class levels, which have been provisionally met by a rapid increase in the number of orthodontists. There are other agencies, including medicine and dentistry, which may at any time exercise their own prerogatives in matters brought to their attention concerning the protection and welfare of the dentofacial area or in medical matters affecting the general physical economy.

One of the essential requirements which should be taught every student or prospective orthodontist under any and all disciplines is orthodontic history. As all coming events cast their shadows before them, there is no better yardstick by which to measure our short history than a review of the comparatively few decades of our existence.

It is safe to state that no one individual contributed more than Dr. Norman W. Kingsley, authentically accredited as the "Father of Modern Orthodontics." During his days of active achievement, from 1852 until after the turn of the century, this great genius systematically collected and consolidated all of the existing principles of orthodontic appliances and philosophies. Following Kingsley appear the names of men of such stature as J. N. Farrar, C. F. Delabarre, S. H. Guilford, Henry Baker, E. H. Angle, V. H. Jackson, F. A. Bogue, E. S. Talbot, G. C. Ainsworth, C. S. Goddard, C. S. Case, C. W. McGill, and other pioneers to whom orthodontics in retrospect owes much recognition today. They were all highly individualistic, largely free-lance thinkers, and each made substantial contributions.

One of the most outstanding and amazing events in American orthodontics was the organization and founding of the Angle College or School in 1901, which continued as such through 1911. Dr. Lloyd S. Lourie, a member of this Golden Anniversary Group, now residing in Santa Monica, California, is the only remaining member of the first class of thirteen students. Other Angle graduates among our colleagues here today are Jake Gorman, Bob Strang, Harvey C. Pollock, Sr., and Samuel J. Lewis. It is also a great pleasure to have Andrew Jackson here with us today, as well as to welcome most heartily one of our newcomers affectionately known as Bill Flesher (Dewey, 1916). Dr. Angle practically hand picked all the members of the eleven classes, and it is noteworthy that these outstanding men represented the greatest *consolidated group* of pioneers which any subsequent period has ever produced.

At a dinner concluding the first Angle course, the American Society of Orthodontists was organized and became effective in 1902. If the leaders in orthodontics prior to 1900 could be called the trail blazers, the graduates of the Angle School were the real covered wagon pioneers. These wonderful men, both gentlemen and orthodontists, were definitely referred to as the "men whom Fate had ruled to mold the destinies of the specialty of orthodontics." Dr. Angle should be ascribed the highest credit for the basic things he believed and taught. He was a strong advocate of the fact that many controlling factors in orthodontics required deeper medical knowledge in case management

than the more demonstrative dental skills. The high professional standing and achievements of the large majority of his students remain an everlasting tribute to his lofty concepts and firm guiding hand.

The Dewey School started on the same general pattern and was conducted until 1923, when that school underwent a rather complete reorganization. It became my privilege to teach in several of these courses conducted by Dr. Dewey, and I can only state through personal contacts and otherwise that many of our most brilliant clinical men and outstanding leaders of today are graduates of the Dewey School prior to 1923.

It has always been my contention that these schools conducted under proprietary disciplines provided the necessary vehicular facilities which inspired the large majority of their students to establish high-class and successful orthodontic practices, and in many cases to attain distinction in our specialty.

In addition to these two proprietary schools, there was the International School operating in Kansas City under the direction of Drs. Brady and Tanzey, and Dr. Angle reopened a school of instruction in Pasadena sometime in the early 1920's, about which Spencer Atkinson knows more than I do. All of these schools produced leaders of their period, and there were many other orthodontists who attained prominence in other ways.

One wonders why and how those leaders and pioneers accomplished the great achievements which were made by them. In pondering over this thought it came to my mind that there were certain axioms which must be followed by all those who have accomplished so much in their lifetimes. I have therefore listed some of the things which I believe are essential for success.

AXIOMS OF ACHIEVEMENT

1. There are conditions to which some people may become attracted which result in tangled lives and thwarted ambitions.
2. Success is a relative term which does not mean merely making money or a reputation.
3. As a groundwork it is first necessary to form a correct concept of what success really is and how it is achieved.
4. The achievement of success cannot be a partial thing.
5. Success, in the larger sense, is attained by those who honestly and efficiently serve those whom their calling requires them to serve.
6. There are no short cuts of any other ways to outsmart success.
7. Devotion to detail is the secret of success; precision is not an accident.
8. Misguided attempts to follow the fads or pet theories of others are first steps toward failure; following accepted applied principles permits the development of independent and sound personal skills.
9. Differences in talent and initiative will always give some men more success than others.

10. Energy and hard work are essential factors; no success worthy of the name ever comes to a man except through his own personal effort.
11. If a man has chosen work above his caliber he had best change to something that better fits his capacity, for in order to make achievements a man must be at ease in his work and love it.
12. Every man who gives the best that is in him to his work, his family, and his fellow man is a success.

PRECEPTORSHIPS

In addressing this august body on the general subject of achievements, it would be remiss on my part not to include the long-established tradition of preceptorships.

Preceptorships have been the bone and fiber and a vital lifeline throughout the records and history of orthodontics and this seems destined to remain so indefinitely. This form of training has been recognized as an established institution in all of the professional cultures since the days of antiquity. It is the priceless transmission of knowledge, experience, and their practical application proffered as a capital investment from masters of experience.

Preceptorships, so long established, include many phases of mutual benefits shared alike by donor and recipient and possess an infinite range of variation which cannot be acquired in any other way. A young man, regardless of his aptitude or preparation, when embarking alone upon his career can only be exposed to the pitfalls of his experience and must learn the hard way. A complete analysis of all the benefits of preceptorships to young men would be a volume within itself and would only reflect the mirror image of the possibilities of their expanding qualifications and the caliber of their future achievements. Before the days of the first medical and dental schools preceptorships were the *only* avenue through which a young neophyte could satisfy his ambition to embrace medicine or dentistry.

I have read with a great deal of interest the article entitled "Thoughts About Membership in the American Association of Orthodontists" by our own Bill Alstadt, president-elect of the American Dental Association. His analysis of the present situation in this growing problem is a very fair appraisal to which one cannot but fully agree. Once again this becomes an overlapping of the past with the demands of progress, which is more or less to be expected since the advent of postgraduate training.

In 1949 the Council on Dental Education of the A. D. A. served a preemptory directive to the American Board of Orthodontics to the effect that the minimal requirements of the Board for eligibility of applicants would have to be doubled in both preceptorship and academic requirements. The American Board, after thorough consideration and conferences with the Council on Dental Education, adopted these rulings governing the eligibility of applicants for certification which went into effect in 1952. These requirements of the

Council on Dental Education were concerned with the *time* element only and had nothing to do with academic or curricular schedules or the regulation of preceptorship training.

The first postgraduate course in orthodontics was established in 1922 at Columbia University under the directorship of Dr. Leuman M. Waugh, who recognized that our specialty had developed to the point where formal training at accredited college level was indicated. At this point it seems desirable that the Council on Dental Education should collect definite information from all colleges and universities as to the actual subjects and systems taught in order to establish minimal requirements as to teaching methods and techniques, which are infinitely more important than the mere matter of time.

Dr. Alstadt's article, which appears in the April issue of the JOURNAL, and which is most valuable and important for all of you to read, states that there are now twenty-one graduate programs which issue certificates, or a master's degree upon completion of further research and a thesis. An analysis of these two academic years as ordered by the Council on Dental Education and adopted by the American Board of Orthodontics would reveal the following facts: the total of sixteen months, whether divided or continuous, would include sixty-four weeks, requiring a minimum of thirty-three hours per week, which would comprise a scholastic schedule covering at least 2,000 hours. While all of this is taken for granted by the implication that courses are being taught, there is no available information, more than casual inquiry can furnish, as to the wide range of differences in schedules and whether or not all of this accountable time is being consumed.

It is my belief that something should be done about this halfway situation. Whether or not it is a duty of the American Association of Orthodontists to contact the Council of Dental Education in this matter, I do not know. Any such time requisite alone means nothing until full information can be officially collected from the courses in all accredited schools for a thorough survey and the establishment of more nearly standard academic requirements. It is obvious that the American Board is more directly involved because of the advantage adequate information has in the performance of their duties. It may be possible that Dr. Alstadt, when president of the American Dental Association, could pursue the solution of this present problem with the cooperation of the Council on Dental Education.

It seems a natural expedient for the graduate or postgraduate to prefer a period of perhaps not longer than five years in the office of a qualified member of the American Association of Orthodontists, rather than to utilize such academic training of whatever nature he has gained to start out alone. After all, sixteen months under the best academic facilities is not very long, and the results become entirely dependent upon the nature of the courses which have been offered by the professor in charge and his staff. One thing certain is that a preceptorship means a golden opportunity to any young man who aspires to dig out the rudiments of experience by means of actual practice under an older orthodontist!

GROWTH OF ORTHODONTICS

When I left Atlanta in September, 1917, there were four known orthodontists in exclusive practice throughout the states which now comprise the Southern Society of Orthodontists. They were Jake Gorman (Angle, 1903), Clint Howard, of Atlanta (Angle, 1911), George Crozat (Dewey, 1915), and Oren Oliver (Dewey, 1916).

I left Atlanta firmly determined never to return to the same orthodontics I left there, and accepted a commission for a career in the Regular Army Dental Corps for that reason. It remained for Dr. John V. Mershon, through his kindness and encouragement, to divert the course of my career back into orthodontics. After putting up a real struggle with Clint Howard between 1911 and 1917 to render effective, if not master, the Angle pin and tube and the ribbon arch multibanded appliances, there was a reversion back to the Jackson and Angle "E" arch appliances as our sole redemption. With the Jackson appliances one could gloat over the spectacular expansion of arches at least ½ inch or more in six months, and then spend the next few years wondering what to do about it! Those patients were promoted into what Jim McCoy very fittingly calls the "alumni group."

At present there are 238 over-all members in the Southern Society; the Southwestern records 171 members; and the Northeastern Society has a total of 610 members, of whom 449 are of active status and 150 are associates who will become eligible after three certified years to full membership in both the N.E.S.O. and the A.A.O. Walter Ellis, in a letter, informs me that there were 71 members of the American Association of Orthodontists in 1912; in 1921 there were 161. According to a letter from Earl Shephard, there are 1,725 active members in the A.A.O. at present and, if they keep on coming in as they have this year, in another ten years there will be double this number. These growth records should elicit some interest, if not more serious concern.

While every licensed dentist has the personal right to make a decision as to specialization, the big question is: What are the principal attractions which they have in mind in specializing? Is it some impelling dramatic influence, and from what source does it emanate? Suffice it to say the social, economic, professional, and health services should be given some very serious consideration.

After mature thought, I would like to make a recommendation to the Board of Directors of the American Association of Orthodontists that they consider the appointment of a special committee for the express purpose of conducting a survey of the eight sectional societies, with a suitable questionnaire directed to their secretaries requesting information as to the personnel of their membership over the past ten years and the reasons or the sources which caused them to specialize in orthodontics. If minority groups with personal motives in mind should become active, their long-range objectives could subsidize the A.A.O., the A.B.O., and the eight sectional societies, and even our JOURNAL could become victimized, all of which might result in a brutal fight for survival. Surely this great body, with its magnificent record, is not going to stand for any such developments.

DESTINY OF ORTHODONTICS

With the enlightenment of all these foregoing facts, it is obvious that the most epic years in the history of orthodontics occurred during the period prior to 1900 and during the early years of this century. Like the pyramids of old, the early pioneers laid the foundations so firm and so strong that all the superstructures of today and those which will be added through the annals of time can rest securely upon them. As a summary of these thoughts, orthodontics has not only weathered several climactic periods of evolution, but has successfully accomplished a most satisfactory degree of progress. The future, although not fully predictable, seems destined to be directed by strong guiding hands.

PROPHESY

It is my prophesy that, as in the older branches of all the healing arts, the future of orthodontics will continue to undergo a series of changes. It is my most abiding belief that there will eventually be a compromise, or a certain degree of leveling, as demonstrated by the progressive changes in older specialties. Through similar processes, orthodontics should become more and more a prescribed therapy in which any appliance load should be comparable to any therapeutic or surgical form of *treatment load,* and the best orthodontists will be those most capable of doing the least they can at the right time.

These advancing adjustments should include all the vital laws of heredity and genetics as well as the impact of external agencies to which all individuals are subject to exposure. Several cardinal principles involving the esthetic appearances of the face and teeth, as well as the proper protection of function, and the preservation or restoration of the dental-oral area must be recognized as vitally important health factors.

It should be a happy day when we can consolidate our philosophies and coalesce our therapies to the extent that the principal differences in our procedures would be those of operational skills. The attainment of this stage in our development would be a repetition of the experiences of the many specialties which have preceded us and have had longer experiences in achieving this high plateau. Under many conditions there can be no better treatment than the following prescription:

The tincture of time
Plus judicious neglect
Flavored with the essence of encouragement.

CONCLUSION

In conclusion, may I personally thank all of you, my friends, for this privilege of appearing before you. It has been with most serious and earnest endeavor that I have attempted to interpret and translate the thoughts herewith presented so as to relate them to the succession of events which have recorded the story of our "Days of Achievement." You can rest assured that, with real devotion in my heart, there has been no intention of any criticism

which could be construed as other than purely constructive comment. It is my great hope that this will leave some thoughts in your minds to take home to consider in your quiet moments.

Let us again turn our attention to our distinguished guests of honor, these Golden Anniversary men. As a token of our further appreciation and esteem, and in recognition of their "Days of Achievement," let us all rise and accord them a hearty applause.

121 E. 60TH ST.

SCIENTIFIC PROGRAM AT NEW ORLEANS

The following is from the pamphlet distributed by the Program Committee to brief members upon the background of essayists prior to the 1957 annual meeting. This is published with the hope that, in the event this plan is followed in subsequent years, the record can be published annually in the JOURNAL.

SPEAKERS

HAROLD J. NOYES, D.D.S., M.D., Portland, Oregon.

Graduate, D.D.S., University of Illinois, 1928, and M.D., Rush Medical College, University of Chicago, 1933. Served in Department of Pediatrics, Rush Medical College, 1933-40 and the Presbyterian Hospital Staff, Chicago (Diseases of Children), 1936-40. Chairman and Professor, Department of Orthodontics, Northwestern University, 1940-46. Past President, American Association of Dental Schools. Past Editor, *Angle Orthodontist*. Author, *Dental Histology and Embryology* (Noyes, Schour, and Noyes). Dean and Professor of Dentistry, Dental School of the University of Oregon, 1946-, and Clinical Professor of Dental Medicine, University of Oregon Medical School, 1946-. Diplomate, American Board of Orthodontics.

Dr. Noyes spoke on the basic etiological subject: "Malocclusion Is a Resultant of:—GENETICS."

Synopsis:

The profession and public alike have in greater or less intensity of conviction long believed that heredity played a role in malocclusion and facial deformity. In the first quarter of this century, the genetic factor in etiology of malocclusion was given little attention. A broader understanding of the complexity of the mechanism of inheritance, particularly the impact of genetic units one upon another, has provided explanation in part, at least, for clinical and experimental observation and the pendulum of contemporary thought now swings in the direction of greater acceptance of inherited form, substance, and physiological function.

The immediate reaction of many orthodontists is a measure of frustration. This need not be the case. The evidence of genetic contribution to the deformity should be explored in history and case analysis. As indicated in the cases presented, both treatment and prognosis rest upon the inherent potentialities of the patient and impact of function, disease, nutrition, pressure, and tracema upon him. This relationship is not limited to the dentition and face, but includes the individual considered as a biologic unit.

HARRY SICHER, M.D., Sc.D., Chicago, Illinois.

Native of Vienna, Austria, where he received a medical degree in 1913, and taught at the University of Vienna Medical School, first as instructor in anatomy, then in the Department of Dentistry, where he was appointed Associate Professor in 1933. In Chicago, he served as Associate Professor

of Anatomy at the Chicago Medical School from 1939 until 1942 when he joined the Faculty of the Loyola University School of Dentistry. He is now Professor of Anatomy and Head of the Department at this school and Guest Lecturer at Northwestern University Dental School. Dr. Sicher received an honorary degree of Doctor of Science from Loyola University in 1952.

Dr. Sicher spoke on the basic etiological subject: "Malocclusion Is a Resultant of:—BONE INEQUITIES."

Synopsis:

Growth of any bone is a consequence of three balanced and integrated processes, namely: (1) growth of the "model tissue," (2) growth of bone tissue, and (3) modeling resorption. In "long" bones the model tissue is cartilage and its derivatives, epiphyseal and articular cartilages determine by their growth the length of the bone. In the skull the model tissue is partly cartilage—at the cranial base and in the mandibular condyle—partly connective tissue at the junction of the several cranial bones at the roof of the braincase and in the upper face. The cartilages at the base and the connective tissue at the "sutures" are, therefore, functionally homologous and also functionally identical with the epiphyseal cartilage plates. While epiphyseal and articular cartilages in long bones and the basilar cartilages of the skull grow interstitially, the (secondary) cartilaginous plate at the mandibular condyle grows appositionally. This difference is, biologically speaking, of greatest significance and it can be argued that because of its mode of growth the mandible is a bone different from all other bones of our skeleton. This difference, in turn, might be responsible for isolated interference in mandibular growth by genetic, hormonal, or nutritional aberrations. Thus, "malocclusions" are probably most often caused by underdevelopment or overdevelopment of the mandible.

THOMAS D. SPEIDEL, D.D.S., M.S., Minneapolis, Minnesota.

Undergraduate and graduate degrees from the University of Iowa. Has taught at the Universities of Tennessee, Iowa, and Indiana and Loyola University of New Orleans, where he served as Dean of the School of Dentistry. Since 1948 has been Professor of Orthodontics at the University of Minnesota, School of Dentistry. Editor, *Journal of Dental Education,* 1940-47. President, 1957, Central Section of the American Association of Orthodontists. Former member, Education Committee of the American Association of Orthodontists and at present a member of the Research Committee. Lecturer and frequent contributor to the literature.

Dr. Speidel spoke on the basic etiological subject: "Malocclusion Is a Resultant of:—INTRINSIC OR LOCAL FACTORS."

Synopsis:

The development and maintenance of the occlusion of the teeth are influenced by many factors. These factors and their effects vary from person to person and may vary from time to time within each person. The variations may be additive, relatively small variations in several factors working together to produce a severe discrepancy. Conversely, the variations may be compensatory, tending to offset each other so that the net result is satisfactory. When adequate compensation fails to occur, then these variables are considered to be etiologic factors in the production of malocclusions.

The influencing factors that, through tradition, have come to be known as "local" factors in malocclusion can be placed in two groups. One group includes all of the many possible

physical variations, excesses or deficiencies, of the teeth. The other group includes a multitude of operational variations, likewise excesses or deficiencies. These are variations in growth of the tooth-bearing region, pre-eruption migration of developing teeth, eruption of teeth, and forces within and around the dentoalveolar structures.

Clinically, it is important to recognize, appraise, and control the many influences that are actually or potentially damaging. True prevention of many of these disrupting excesses and deficiencies is not yet possible.

T. M. GRABER, D.D.S., M.S.D., Ph.D., Chicago, Illinois.

Graduate, D.D.S., Washington University (St. Louis), 1940; M.S.D., Northwestern University, 1946; Ph.D., Northwestern University Medical School, 1950 (major fields, anatomy and orthodontics). Until 1952 he was Assistant Professor (Orthodontics) at Northwestern, becoming Deputy Chairman of the Department (1950-53) and in 1953 became Associate Professor of Orthodontics. Dr. Graber is Director of Research, Northwestern University Cleft Lip and Palate Institute. He is a frequent lecturer and contributor to the literature, in 1955 lecturing in London, Copenhagen, and Stockholm and in 1957 will make a tour of the Far East under the auspices of the State Department. He is a Diplomate of the American Board of Orthodontics.

Dr. Graber spoke on the basic etiological subject: "Malocclusion Is a Resultant of:—EXTRINSIC OR GENERAL FACTORS."

Synopsis:

This paper will complete the sequence on "Malocclusion Is a Resultant of—" and will thus be integrated with the presentations of the previous speakers.

Recognizing semantic limitation and controversy over terminology, hereditary and environmental aspects will be developed. Under the hereditary aspect, our latest knowledge on the "pattern malocclusion" with regard to alveolar and apical base dysplasias will be discussed. Critical appraisal of the roles of prenatal, birth, and postnatal factors will be made. The dynamic role of the musculature as seen in the most recent myographic studies will be emphasized. A study of a large number of finger-sucking patients, now going on at Northwestern University, will serve as the basis of remarks on the finger habit. An analysis will be made of leaning habits, swallowing habits, and functional perversion and adaptation of musculature to aberrant morphological patterns.

EDWARD A. CHENEY, D.D.S., M.S., Lansing, Michigan.

Graduate, University of Michigan, D.D.S., 1942, and received M.S. degree in Orthodontics in 1944 from the University of Michigan. Diplomate of the American Board of Orthodontics. At present in private practice in Lansing and is an Associate Professor of Dentistry (Orthodontics) at the University of Michigan.

Dr. Cheney spoke on the basic treatment subject: "Aims and Methodology of Corrective Measures According to Age Groups:—THE DECIDUOUS DENTITION."

Synopsis:

There are many malocclusions which are initiated or intensified by factors influencing dentofacial growth and development during the primary dentition. The paper will consider these factors and their influence and give attention to objectives and methods of treatment applicable to this stage of dental development.

FAUSTIN N. WEBER, D.D.S., M.S., Memphis, Tennessee.

Graduate, D.D.S., University of Michigan, 1934, and M.S. in Orthodontics, University of Michigan, 1936, having in 1935-36 been Research Fellow in Orthodontics. Assistant Professor of Orthodontics, 1936-41, and Associate Professor of Orthodontics, 1941-51, College of Dentistry, University of Tennessee. Professor and Head of the Department of Orthodontics, College of Dentistry, University of Tennessee since 1951 and since 1937 has devoted one-half his time to teaching and one-half to the private practice of orthodontics. Diplomate of the American Board of Orthodontics. Frequent lecturer and contributor to the literature.

Dr. Weber spoke on the basic treatment subject: "Aims and Methodology of Corrective Measures According to Age Groups:—THE MIXED DENTITION."

Synopsis:

During the past twenty years, the attitude of orthodontists regarding the advisability of treating certain types of malocclusion in the mixed dentition period has changed twice.

From the confirmed belief most orthodontists had in the 1930's that almost all Class II, Division 1 malocclusions and many Class I cases with deficient arch length could be treated advantageously in the mixed dentition period, orthodontic opinion shifted to the diametrically opposite viewpoint that very few types of malocclusion could be treated with any permanent benefit at this stage. At present there is growing conviction in favor of more treatment during the period of the mixed dentition.

There are a few rather well-established principles that are applicable to orthodontic treatment in the mixed dentition regardless of the type of appliance employed in any therapeutic effort. These principles will be considered, and an effort will be made to analyze the treatment potentialities during this stage of dental development.

MALCOLM R. CHIPMAN, B.S., D.D.S., Spokane, Washington.

Graduate, 1921, Washington State University, B.S., Electrical Engineering; attended Northwestern University Dental School one year and transferred to the University of Southern California, graduating D.D.S. in 1925. Past-President, Washington State Dental Association, Past Vice-President of the Pacific Coast Society of Orthodontists and the American Association of Orthodontists. Frequent contributor as essayist and clinician.

Dr. Chipman spoke on the basic treatment subject: "Aims and Methodology of Corrective Measures According to Age Groups:—THE PERMANENT DENTITION."

Synopsis:

What are the fundamental aims of orthodontics? These should include function; esthetics, dental and facial; speech; elimination of pathogenesis; normal musculature; and the future stability of the denture. There are other desirable aims, but the above are basic in the accomplishment of our purposes.

In planning any treatment of the permanent dentition, a number of factors must be considered; etiology, age, physical background, the probability of further development during the period of projected treatment, dental health, emotional stability of the patient, and in many cases the time factor are very important. In considering etiology it is necessary to ascertain if causative factors are still present and, if so, what effect they may have on the projected treatment.

There is a wide variety of appliances in use today. It is quite essential that the therapy of choice be fully capable of accomplishing the desired aims. With this thought in mind, consideration will be given a few of the more widely used technics, and their application to the case in hand. The therapy employed should be consistent with the anticipated results, and the circumstances of treatment.

DONALD C. MacEWAN, D.D.S., Seattle, Washington.

Studied chemical engineering, Kalamazoo College, 1916-17; 1919-21; graduate, D.D.S., University of Michigan, 1925. Graduate study of orthodontics, Michigan, 1925-26. Private practice, Seattle, since 1926. Guest lecturer, University of Washington Orthodontics Department and Preceptor, Seattle Orthodontic Study Club since 1937 and the Pacific Northwest Orthodontic Study Club since 1946. Diplomate, American Board of Orthodontics.

Dr. MacEwan spoke on "Some Illusory Phenomena of Importance in Orthodontics" (an American Board of Orthodontics thesis, 1956).

Synopsis:

Optical illusions are distortions of judgment in vision or in interpretation of visual perception. They are normal, universal, often unavoidable, and in general we are unaware of them. Some typical examples will be shown, followed by recommendations intended to avoid, minimize, or compensate for the errors produced. Awareness of optical illusions is an important factor in successful orthodontic practice.

PANELISTS

WILLIAM S. SMITH, D.D.S., San Francisco, California.

Graduate, University of California, D.D.S., 1928, and of the Graduate Course in Orthodontics, 1930-31. Lecturer, Department of Orthodontics, University of California. Former Editor, *California Alumni News-Letter* and Treasurer of the Alumni Association. Former Program Chairman and later President of the California State Dental Association. Co-Chairman, Hawaii-California meeting, Honolulu, 1955. Diplomate, American Board of Orthodontics. Frequent lecturer and clinician.

Dr. Smith moderated the panel discussion of "Parent and Patient Personality and Psychological Programs."

Synopsis:

Modern orthodontic therapy not only includes advanced diagnostic and mechanical aids toward actual tooth positioning but involves a patient-parent-orthodontist cooperative relationship which has not been as fully comprehended or accepted as its importance justifies. Personality traits, unrecognized at consultation, influence markedly the result of therapy efforts. Methods to improve patient-parent-orthodontist relationships are difficult to invoke because the orthodontist, lacking training in the fields of psychiatry and psychology, must make an empirical approach to the many and varied aspects of the problem. Knowledge of these fields, even if limited to brief educational excursions through scientific programs in our meetings, will give the cumulative applied experience of sensible advice and control so essential to improvement in treatment and permanence of result.

M. DUKE EDWARDS, D.D.S., M.S., Montgomery, Alabama.

Attended the University of Florida, 1927-31, and graduated D.D.S., Emory University, 1935. Graduate studies in orthodontics at Michigan, 1938-40, receiving the M.S. degree in orthodontics. Diplomate, American Board of Orthodontics. Former Secretary and Director of the Southern Society of Orthodontics and Past-President, Second District Dental Society of Alabama. Former member, Alabama State Board of Dental Examiners.

Dr. Edwards was a member of the panel which discussed "Parent and Patient Personality and Psychological Problems."

T. M. GRABER, D.D.S., M.S.D., Ph.D., Chicago, Illinois.

Biography will be found in speakers' list.

KYRLE W. PREIS, D.D.S., Baltimore, Maryland.

Graduate, D.D.S., Baltimore College of Dental Surgery, Dental School, University of Maryland, 1929. Associated with Harry E. Kelsey, 1929-35. Former Instructor and Special Lecturer and presently Professor of Orthodontics at Maryland. Consultant in Orthodontics, Johns Hopkins Hospital. Past-President, Baltimore City Dental Society and the Maryland State Dental Association. Former Secretary, Maryland State Board of Dental Examiners. Frequent lecturer; in 1954, while in Europe, spoke in Paris and London.

Dr. Preis was a member of the panel which discussed "Parent and Patient Personality and Psychological Problems."

PHILLIP H. STARR, M.D., Omaha, Nebraska.

Graduate, University of Toronto Medical School, M.D., 1944, and interned at the Hamilton General Hospital, Hamilton, Ontario, 1944-45. Psychiatric Training in Adult and Child Psychiatry at Washington University Medical School and Barnes Hospital, St. Louis, 1946-50. Chief Psychiatric Consultant, St. Louis Children's Hospital, 1950-55; Director of Child Guidance Clinic of Washington University, 1952-55, and Chief, Children's Outpatient Services, Nebraska Psychiatric Institute, Omaha, January, 1956, to date. Was Assistant Professor in the Departments of Neuropsychiatry and Pediatrics at Washington University, 1954-55, and is Assistant Professor in the Department of Neuropsychiatry, University of Nebraska Medical School, Omaha. Diplomate, American Board of Psychiatry and Neurology and Fellow, American Psychiatric Association and the American Orthopsychiatric Association.

Dr. Starr was a member of the panel which discussed "Parent and Patient Personality and Psychological Problems" and opened the panel discussion with a brief generalized statement.

BROOKS BELL, D.D.S., Dallas, Texas.

Graduate, Baylor College of Dentistry, D.D.S., 1925, and the Dewey School of Orthodontia, 1925. Diplomate, American Board of Orthodontics. Charter

member of the Denver Summer Seminar for Advanced Orthodontics, serving as its Chairman, 1940. President, Southwestern Society of Orthodontists, 1947, and the American Association of Orthodontists, 1953. Dr. Bell appeared before the Mexican Orthodontic Society (of which he is an honorary member) at the University of Mexico in Mexico City, lecturing on stainless steel, and before several American orthodontic societies lecturing on "Office Routines and Psychology in the Orthodontic Office."

Dr. Bell moderated the panel discussion of "Office Procedures, Business Management, Office Location, Associations and Partnerships."

Synopsis:

These nonscientific yet basic considerations in the practice of one's profession, no matter whether it be medicine or dentistry, cannot be ignored or brushed lightly aside. From the day of graduation, professional service is influenced by the ability to adjust to circumstances, or to plan to cause them to adjust to you. The ability to cope with the vicissitudes of practice or to benefit from opportunities depends on one's recognition of favorable and unfavorable aspects in the merging of business acumen with ethical considerations. To contend that these two facets in our highly specialized field cannot merge to mutual benefit is illogical, in fact, an error of judgment. So the novitiate and the man of more experience should face these issues in a rational manner and try to find solutions to their problems. The inclusion of these subjects in this program is planned to aid you in that respect.

STEPHEN C. HOPKINS, SR., B.S., D.D.S., Washington, D. C.

Graduate, University of Michigan, B.S., 1917; Georgetown University, D.D.S., 1922; Instructor and Professor of Orthodontics, Georgetown University, 1924-40. Diplomate, American Board of Orthodontics; Director, American Board of Orthodontics, 1946-52; Sectional Editor, *American Journal of Orthodontics* and member, Publications, Public Health, Inter-Relations, and Program Committees of the American Association of Orthodontics at various times.

Dr. Hopkins was a member of the panel which discussed "Office Procedures, Business Management, Office Location, Associations and Partnerships."

V. EVERETT HUNT, B.S., D.D.S., Eureka, California.

Graduate, B.S., University of California; D.D.S., College of Physicians and Surgeons, 1941. Was raised in an orthodontic and investment atmosphere. His late father was known to many orthodontists as a person endowed with unusual financial sagacity. Everett Hunt has continued that interest and today is as busy with general business investment affairs and the management of trust funds as with his private practice of orthodontics. Lecturer at the College of Physicians and Surgeons on practice management, office designs, and investments. Diplomate, American Board of Orthodontics.

Dr. Hunt was a member of the panel which discussed "Office Procedure, Business Management, Office Location, Associations and Partnerships."

CECIL G. MULLER, D.D.S., Omaha, Nebraska.

Graduate, Creighton University, D.D.S., 1933. Associated with the Forsyth Infirmary for Children, Boston, 1934. Professor of Orthodontics, Creighton School of Dentistry, Omaha. Diplomate, American Board of Orthodontics.

Dr. Muller was a member of the panel which discussed "Office Procedures, Business Management, Office Location, Associations and Partnerships."

ALEXANDER SVED, C.Eng., D.D.S., New York, New York.

Graduate, 1914, in Civil Engineering, Cooper Union Day School of Technical Science, and D.D.S. in 1918 from the New York College of Dentistry. Chief of Orthodontic Clinic at the Hospital for Joint Diseases for twenty-one years and now serving as Consultant. A frequent lecturer and contributor to the literature. Diplomate, American Board of Orthodontics.

Dr. Sved was a member of the panel which discussed "Office Procedures, Business Management, Office Location, Associations and Partnerships."

MEMBERSHIP IN THE AMERICAN ASSOCIATION OF ORTHODONTISTS

INASMUCH as there has been considerable interest manifested among the readers of the AMERICAN JOURNAL OF ORTHODONTICS as to the final resolution adopted with regard to membership in the American Association of Orthodontists, we publish herewith Resolution No. 2 which was adopted in New Orleans in May, 1957.

Resolution No. 2

RESOLVED that Chapter I, Section 2, A of the bylaws be amended by striking out the presently effective provisions and the pending provisions passed in 1955, and substituting therefor the following:

(A) A person who is in the exclusive practice of orthodontics and who is a member in good standing of his local, state, and national dental organization may be elected to membership through his Constituent Society, provided the applicant has been:

1. Five years in the exclusive practice of orthodontics, including a successfully completed orthodontic course of a minimum of 1,500 hours in an approved dental school. The applicant must be recommended by two active members of the Constituent Society within whose jurisdiction he intends to practice; or
2. Five years in the exclusive practice of orthodontics, at least three consecutive years of which shall have been in the office of, and in full-time association with, a practicing member of the American Association of Orthodontics not less than eight years. The applicant must be recommended by two active members of the Constituent Society in whose jurisdiction he intends to practice.
   (a) Notice of the inception of this associateship shall be forwarded within thirty days to the secretary of the Constituent Society of which the senior associate is a member. The senior associate shall inform the secretary of his Constituent Society of the completion of the three years of associateship.
   (b) Should this associateship be unavoidably terminated, the junior associate may apply for special consideration directly to the Admissions Committee of the Constituent Society within whose jurisdiction he practices.

Department of Orthodontic Abstracts and Reviews

Edited by
DR. J. A. SALZMANN, NEW YORK CITY

All communications concerning further information about abstracted material and the acceptance of articles or books for consideration in this department should be addressed to Dr. J. A. Salzmann, 654 Madison Avenue, New York City

Immediate Torsion: A Preliminary Report on Twenty-Three Cases. By Prof. G. E. N. Hallett. *D. Practitioner* **7**: 106-134, January, 1957.

John Tomes (1865), in a letter to McQuillen of Philadelphia, commented on the fact that he had noticed little in American publications concerning an operation which is "now becoming common in England, the twisting of teeth in their sockets then and there with a pair of forceps for the purpose of correcting irregularity of position."

The most favorable age for its performance, Tomes thought, should be about "9 or 10 years, when the teeth are fully erupted, but when their sockets had not yet attained full strength." Tomes suggested that it may be necessary to twist the tooth somewhat farther than is required, owing to its tendency to spring back somewhat to its original position.

Immediate torsion is probably a matter of autogenous replantation with the tooth never leaving the socket. There is a minimum of sepsis because the tooth never leaves the socket, and therefore healing conditions are at an optimum. Mostly they show either slow or galloping resorption, but in a few cases it becomes almost impossible to detect that the tooth was ever parted from its socket. The reacceptance by the body of its own tissues, either reimplanted or transplanted, is always a matter of great surgical interest, as is the acceptance of grafts and implants of heterogenous origin, and the plastic and ophthalmic surgeons continue to persuade the body to accept a variety of materials in place of the natural tissues, such as Orlon, nylon, acrylic, tantalum, and stainless steel.

Under local or general anesthesia the crown of the tooth is seized by forceps designed to prevent the tooth from leaving its socket and, with a steady and mounting force, a rotatory movement is applied. When the tooth is loosened—that is to say, when all the fibers of the periodontal membrane rupture—it will turn very easily. It must not be pressed too firmly in an apical direction. In its new position (which may not be wholly satisfactory labiolingually) it should be steadied and then splinted. There is slight gingival hemorrhage. The splint is only partly prefabricated by constructing orthodontic bands on one or more of the adjacent teeth and also to the turned tooth before operation. To the stabilizing teeth is welded a piece of 1 mm. stainless steel wire. Immediately after the torsion in the case of local anesthetic, or one-half to three-quarters of an hour afterward in the case of a general anesthetic, the bands are reapplied and the bar is adjusted with pliers until it lies passively upon the band on the turned tooth. A light weld is then made and a little solder may be added. The splint is then cemented, left in place for two or three weeks, and removed. So far there has not been any postoperative discomfort in any case. The prefabricated splint is likely to hold the tooth in

a position of strain in relation to its socket, while the one made up after the torsion will not do so. On occasion the tooth has seemed to be firm immediately after torsion so that the author left it thus, unsplinted, merely asking the patient to be careful, and there has been no untoward result.

A minimum of five years must elapse before one can determine reliably the reactions of the tooth and investing tissues. During the turning, if the tooth has been still and obstinate, small fragments of cementum may become detached. This would leave bare dentine, and a focus for resorption may be created. If the tooth yields easily this is less likely to happen. During a difficult turning, extra force is needed. When applying the forceps, only turning force should be applied, as any intra-alveolar intrusion of an immature tooth into its socket should be avoided. Such force could easily cause compression of the very delicate pulpal tissue against the base of its socket, which could produce in turn intrapulpal hemorrhages which might lead to greater degenerative changes than otherwise. Also the pressure of the beaks of the forceps on the tooth crown momentarily distorts the underlying flexible dentine. Compression of the crown by the forceps may also fracture the enamel. By interposing lead foil between the blades, this is less likely to happen.

The author usually chooses a stage of development where the root is at least three-quarters completed. This seems to be the optimum stage of development. If turned too soon, not only may pulpal compression be easily caused, but a large area of Hertwig's sheath will be torn and deformed.

Immediate torsion on single-rooted teeth can be demonstrably successful and teeth so turned are now serving perfectly well with good vitality and without sepsis, change of color, or periodontal breakdown more than seven years after treatment. In most cases some resorption of the root takes place, which is usually followed by repair tissue, and eventually a status quo is established. In a few cases the resorption proceeds at a greater pace than repair and the root largely disappears. As a result of ankylosis the tooth may become fused with the investing alveolar bone and fail to continue eruption along with the adjacent teeth. A marked disparity of occlusal level then becomes apparent, which is esthetically displeasing.

Occasionally the tooth may die and abscess formation supervene. The enamel may be chipped in certain cases of stubborn teeth. The gingival condition seems to remain uniformly excellent. It is suggested that in cases of gross rotation, cleft palate, and others with supernumerary involvement immediate torsion may justifiably be employed.

Child Psychiatry and the General Practitioner. By George E. Gardner, M.D., Ph.D. *J. A. M. A.* **163**: 105-108, Jan. 12, 1957.

It is well known to psychiatrists, and should be well known to all who labor in any of the health professions, that the effectiveness of therapy, guidance, counseling, and casework is, to a great extent, determined by the subtleties inherent in the relationship established between the practitioner and his patient. This factor has been recognized and utilized by physicians for centuries as a constructive force in the doctor-patient relationship.

One could state that what is needed most is trust in the physician on the part of the child. Trust is effected when the physician senses that, to all intents and purposes, he is thought by the child to embody all the attributes of the good and kindly father and that he has, in the child's mind or feelings, few or none of the features of an actual or fantasied harsh and brutal parent. Whatever things are good are transferred to and become a part of the child's picture of his doctor.

How does the family physician acquire this role? It is acquired through patient listening and sympathetic understanding. What is needed are listening and understanding that are governed and tuned by the physician's conviction that, in attending to the needs of a child, there are more matters that do not meet the eye than those that do. Children are surrounded many times by a world that, in their inexperience, is a fearsome world of actual and imagined threats, and these threats in the child's mind are directed at him, his life, his body, his prestige, his sense of worth-whileness. The physician also senses that a physical or behavioral upset in the child may be directly or indirectly related to the unsolved problems of others in the family group. But above all, if the physician is to establish a relationship through which he can help the child, he must convey to the child through attitudes of patient, helpful attention that all these things are known to and appreciated by physicians and that he can confide in a physician when he can confide in no other human being. Kindliness, sympathy, and careful explanation of procedures that cause pain and discomfort are all that need be added to these other factors to elicit the attitude of trust, which is of the highest therapeutic value.

News and Notes

Central Section of the American Association of Orthodontists

The Central Section of the American Association of Orthodontists will hold its twentieth annual meeting Sept. 23 and 24, 1957, at the Hotel Nicollet in Minneapolis, Minnesota. The program follows:

SOCIAL AND BUSINESS PROGRAM

For Members and Their Ladies

Sunday, Sept. 22, 1957:

3 to 5. Registration—mezzanine.
5 to 7. Cocktail-hour reception to welcome members, Hennepin Room. (Hosts: Twin-City Orthodontists.)

For Members and Guests

Monday, Sept. 23, 1957:

12:15. Luncheon and business meeting, Hennepin Room.
Tuesday, Sept. 24, 1957:

12:15. Luncheon and business meeting, Junior Ballroom. All applicants who have been voted into membership (active or associate) should plan to attend this luncheon.

For the Ladies

Monday, Sept. 23, 1957:

10:30. Ladies' brunch, Waikiki Room.

For Members, Guests, and Their Ladies

Monday, Sept. 23, 1957:

6 to 7. Social hour, The Terrace.
7 to 12. Dinner, entertainment, and dance, Main Ballroom (informal).
Please procure your tickets for all social functions when you register so that the Local Arrangements Committee and the hotel can properly accommodate you.

SCIENTIFIC PROGRAM

Monday, Sept. 23, 1957

8:30. Registration and purchase of tickets.
9:30. Official opening of twentieth annual session.
Thomas D. Speidel, President.
9:40. Correction of Anterior Open-Bite. A color and sound moving picture of a bilateral ostectomy. Surgery by J. C. Tam, produced by Photographic Laboratory, School of Dentistry, University of Minnesota.
10:00. The Edgewise Arch Appliance in Theory and Practice. F. Copeland Shelden, Kansas City, Missouri.
11:00. Centric and Eccentric Headgear.
Sam Weinstein, Omaha, Nebraska.
2:00. Anchorage Consideration in Treatment of Class II, Division 1 Malocclusion.
Howard J. Buchner, Oak Park, Illinois.
3:00. Muscles and Mastication.
Robert E. Moyers, Ann Arbor, Michigan.
4:00. Twin-Wire Treatment Case Reports.
Howard Yost, Grand Island, Nebraska.
4:30. Speech Problems and Orthodontics.
Clark D. Starr, Speech Pathologist, Speech & Hearing Clinic, University of Minnesota.

Tuesday, Sept. 24, 1957

9:00. Mandibular Prognathism. A color and sound moving picture of four cases of ostectomy of the mandible. Surgery by Mellor R. Holland, produced by the Photographic Laboratory, School of Dentistry, University of Minnesota.

9:45. The Role of Mechanics in Extraction Cases.
F. Copeland Shelden, Kansas City, Missouri.

10:45. The Age and Scope of Orthodontic Treatment.
Earl E. Shepard, St. Louis, Missouri.

2:00. Table Clinics.

Necrology Committee
American Association of Orthodontists

Please notify the Necrology Committee of the death of any of our members. This information should be sent immediately to the chairman or to any member of the Committee.

Ernest N. Bach, Chairman
305 Professional Bldg.
Toledo, Ohio.

American Board of Orthodontics

The next meeting of the American Board of Orthodontics will be held at the Commodore Hotel in New York, New York, April 22 through 26, 1958. Orthodontists who desire to be certified by the Board may obtain application blanks from the Secretary, Dr. Wendell L. Wylie, University of California School of Dentistry, The Medical Center, San Francisco 22, California.

Applications for acceptance at the New York meeting, leading to stipulation of examination requirements for the following year, must be filed before March 1, 1958. To be eligible, an applicant must have been an *active* member of the American Association of Orthodontists for at least two years.

Great Lakes Society of Orthodontists

The twenty-eighth annual meeting of the Great Lakes Society of Orthodontists will be held at the Hotel Statler, Detroit, Michigan, Oct. 20 through 23, 1957.

Orthodontists and students desiring to attend may make reservations directly through the Hotel Statler. Tickets for social functions may be procured from Dr. James Reynolds, Adrian, Michigan.

H. Irving Miller,
Program Chairman

Middle Atlantic Society of Orthodontists

The next annual meeting of the Middle Atlantic Society of Orthodontists will be held at the Warwick Hotel, Philadelphia, Pennsylvania, Oct. 20 through Oct. 22, 1957.

Northeastern Society of Orthodontists

The fall meeting of the Northeastern Society of Orthodontists will be held at the Hotel Statler, Buffalo, New York, Oct. 21 and 22, 1957.

Southern Society of Orthodontists

The thirty-sixth annual meeting of the Southern Society of Orthodontists will be held at the Eden Rock Hotel, Miami Beach, Florida, Oct. 27 through Oct. 30, 1957. Reservations may be made by writing direct to the hotel.

Southwestern Society of Orthodontists

The next meeting of the Southwestern Society of Orthodontists will be held Sept. 29 through Oct. 2, 1957, at the Baker Hotel in Dallas, Texas.

Denver Summer Seminar

The Board of Trustees of the Denver Summer Seminar have arranged the following program, to be presented at the annual meeting which will be held Aug. 4 through Aug. 9, 1957, at Writer's Manor:

Opportunities for Fortune Building Under Free Enterprise. Robert E. Moyers, D.D.S., Ph.D., Professor and Head, Orthodontic Department, University of Michigan, and Allen S. Richardson, lecturer in finance at the University of Denver.

Application of Cephalometrics in Field of Dentistry. Robert M. Ricketts, D.D.S., M.S., Pacific Palisades, California.

Diagnosis and Treatment of Cleft Palate Conditions. Robert M. Ricketts.

Evaluation of Functional and Esthetic Balance and Harmony in Orthodontic Case Planning. Robert M. Ricketts.

Utah-Tweed Orthodontic Seminar: Step-by-Step Procedure for the Correction of Malocclusions Using the Angulated Bracket Technique and the Edgewise Appliance.

Entertainment includes the annual supper on the evening of August 4 for members of the Seminar only. Members of the twentieth annual meeting and their families will enjoy famous old Central City and the attractions of the Teller House for dinner, followed by an evening at the opera.

The dates and other pertinent information will be mailed upon completion of necessary arrangements by your Board of Trustees.

Please make hotel reservations directly with Mr. Bob Casey of Writer's Manor, 1730 South Colorado Blvd., Denver, Colorado.

Programs will be sent direct to applicants. Applications are limited and will be given preference in the order of the dates application is made at the Writer's Manor.

Officers of the Denver Summer Meeting are:

Victor J. Benton, President
Wichita, Kansas

William B. Stevenson, Vice-President
Amarillo, Texas

Earl C. Bean
St. Louis, Missouri

H. Carlyle Pollock, Secretary
915 So. Colorado Blvd., Denver 22, Colorado

Louis J. Williams, Assistant Secretary
Casper, Wyoming

George H. Siersma, Treasurer
Denver, Colorado

Richard E. Harshman
Scottsbluff, Nebraska

J. Allen Langenfeld
Centralia, Illinois

Russell Winston
Houston, Texas

American Institute of Dental Medicine

The next annual meeting of the Institute will take place at The Oasis Hotel, Palm Springs, California, Oct. 13 to 17, 1957. The faculty will consist of:

Dr. Edwin F. Alston, Clinical Instructor in Psychiatry at the University of California Medical School, who, because of the close relationship of many psychiatric and psychologic problems to dental practice, will present a series of lectures in this field.

Dr. S. J. Kreshover, Associate Director of the National Institute of Dental Research in charge of intramural dental research, will discuss selected subjects in the field of general and oral pathology.

Dr. K. F. Meyer, Director Emeritus of the Hooper Foundation for Medical Research, University of California, will discuss the exciting story of polio vaccine, as well as the advancement of scientific research in Russia.

Dr. Max S. Sadove, Professor of Surgery, University of Illinois, has been highly recommended for his expert knowledge in the field of anesthesiology. He will correlate the various aspects of this subject to the practice of dentistry.

Dr. Joseph F. Volker, Dean of the School of Dentistry of Alabama University, has agreed to speak about caries and fluoride and dental health.

There will also be presentations by three of the younger research workers in the Division of Oral Biology, School of Dentistry, University of California, who are actively engaged in clinical and laboratory investigations: Drs. Sol Silverman, Theodore Grant, and Howard Myers.

All Seminar lecturers will participate in an open forum, discussing the application of their subject to the practice of dentistry. Because of the mounting interest in this annual meeting of the Institute, early registration is requested.

The Institute also calls attention to the Case History Service which is furnishing dental medicine case histories with Kodachrome slides, medical history, laboratory findings, roentgenograms, and all data pertaining to each individual case.

Applications and full information concerning either the annual meeting or the Case History Service may be secured from the Executive Secretary, Miss Marion G. Lewis, 2240 Channing Way, Berkeley 4, Calif.

American Dental Association

The ninety-eighth annual session of the American Dental Association will be held in Miami-Miami Beach, Florida, Nov. 4 to 7, 1957.

American Association for Cleft Palate Rehabilitation

The American Association for Cleft Palate Rehabilitation will hold its sixteenth annual convention at the St. Francis Hotel in San Francisco on Thursday, Friday, and Saturday, April 24 to 26, 1958.

European Orthodontic Society

The European Orthodontic Society expects to hold its next annual congress in Copenhagen, Denmark, July 3 to 7, 1958, under the presidency of Professor A. Björk.

University of California Establishes Research-Teacher Training Center

The School of Dentistry, University of California, in San Francisco has instituted a Research-Teacher Training program under the direction of Dr. Hermann Becks, Professor of Dental Medicine. The United States Public Health Service, Washington, D. C., has awarded the School a Graduate Training Grant for this purpose for a period of five years.

The Center will provide facilities and instruction in basic research and the principles of biology as they pertain to dentistry. Each year three or more trainees will be placed on a concentrated schedule, under the guidance of the program director and associates, to teach some of the fundamentals of animal experimentation, various types of operations, autopsies, etc. This will be followed by intensive schooling in methods of tissue preparation and a complete study of the gross and histologic results.

Further information may be obtained by writing to Dr. Hermann Becks, School of Dentistry, University of California, San Francisco 22, California.

Notes of Interest

Dr. Gerard A. Devlin announces the association of Dr. Francis J. Hynes at 121 Prospect St., Westfield, New Jersey, for the exclusive practice of orthodontics.

Willard L. Flint, M.S., D.D.S., is now associated with Drs. Wilson R. Flint and Edwin G. Flint in the exclusive practice of orthodontics, 8047 Jenkins Arcade, Pittsburgh, Pennsylvania.

Edward W. Hodgson, D.D.S., M.S.D., announces the removal of his office to 6433 West Florissant Ave., St. Louis, Missouri, practice limited to orthodontics.

William J. Reynolds, Jr., D.D.S., A.B., M.S.D., announces the removal of his office to 609 North Oregon St., El Paso, Texas, practice limited to orthodontics.

OFFICERS OF ORTHODONTIC SOCIETIES

The AMERICAN JOURNAL OF ORTHODONTICS is the official publication of the American Association of Orthodontists and the following component societies. The editorial board of the AMERICAN JOURNAL OF ORTHODONTICS is composed of a representative of each one of the component societies of the American Association of Orthodontists.

American Association of Orthodontists

President, A. C. Broussard - - - - - - - - - Maison Blanche Bldg., New Orleans, La.
President-Elect, Franklin A. Squires - - - - - - - - Medical Centre, White Plains, N. Y.
Vice-President, William B. Stevenson - - - - - - - - 610 West 8th St., Amarillo, Texas
Secretary-Treasurer, Earl E. Shepard - - - - - - - - - - 8230 Forsyth, St. Louis, Mo.

Central Section of the American Association of Orthodontists

President, Thomas D. Speidel - - - - - - - - - University of Minnesota Dental School, Minneapolis, Minn.
Secretary-Treasurer, William F. Ford - - - - - - - - - 575 Lincoln Ave., Winnetka, Ill.

Great Lakes Society of Orthodontists

President, Harlow L. Shehan - - - - - - - 601 Jackson City Bank Bldg., Jackson, Mich.
Treasurer, Russell E. Huber - - - - - - - - 350 Fidelity Medical Bldg., Dayton, Ohio
Secretary, D. C. Miller - - - - - - - - - - - 40 South Third St., Columbus, Ohio

Middle Atlantic Society of Orthodontists

President, Aubrey P. Sager - - - - - - - - 1210 Medical Arts Bldg., Philadelphia, Pa.
Secretary-Treasurer, Paul A. Deems - - - - - - - - - 835 Park Ave., Baltimore, Md.

Northeastern Society of Orthodontists

President, Clifford G. Glaser - - - - - - - - - - 1255 Delaware Ave., Buffalo, N. Y.
Secretary-Treasurer, David Mossberg - - - - - - 36 Central Park S., New York, N. Y.

Pacific Coast Society of Orthodontists

President, A. Frank Heimlich - - - - - - - - - 1824 State St., Santa Barbara, Calif.
Secretary-Treasurer, Raymond M. Curtner - - - - 450 Sutter St., San Francisco, Calif.

Rocky Mountain Society of Orthodontists

President, J. Lyndon Carman - - - - - - - - - - 501 Republic Bldg., Denver, Colo.
Secretary-Treasurer, H. Carlyle Pollock, Jr. - - - - - 1558 Humboldt St., Denver, Colo.

Southern Society of Orthodontists

President, Frank P. Bowyer - - - - - - - - - 608 Medical Arts Bldg., Knoxville, Tenn.
Secretary-Treasurer, H. K. Terry - - - - - - - - - 2742 Biscayne Blvd., Miami, Fla.

Southwestern Society of Orthodontists

President, Tom M. Williams - - - - - - - - 612 Medical Arts Bldg., Dallas, Texas
Secretary-Treasurer, Harold S. Born - - - - - - 908 S. Johnstone, Bartlesville, Okla.

American Board of Orthodontics

President, Lowrie J. Porter - - - - - - - - - 41 East 57th St., New York, N. Y.
Vice-President, William R. Humphrey - - - - - - - - - Republic Bldg., Denver, Colo.
Secretary, Wendell L. Wylie - - - - - - University of California School of Dentistry, The Medical Center, San Francisco, Calif.
Treasurer, Jacob A. Salzmann - - - - - - - - - 654 Madison Ave., New York, N. Y.
Director, L. Bodine Higley - - - - - - University of North Carolina, Chapel Hill, N. C.
Director, B. F. Dewel - - - - - - - - - - - - - - 708 Church St., Evanston, Ill.
Director, Frank P. Bowyer - - - - - - - - - Medical Arts Bldg., Knoxville, Tenn.

Forthcoming meetings of the American Association of Orthodontists:
1958—Commodore Hotel, New York, New York, April 27 to May 1.
1959—Statler Hotel, Detroit, Michigan, May 4 to 7.
1960—Shoreham Hotel, Washington, D. C., April 24 to 28.
1961—Denver, Colorado.

There is an apparent discrepancy

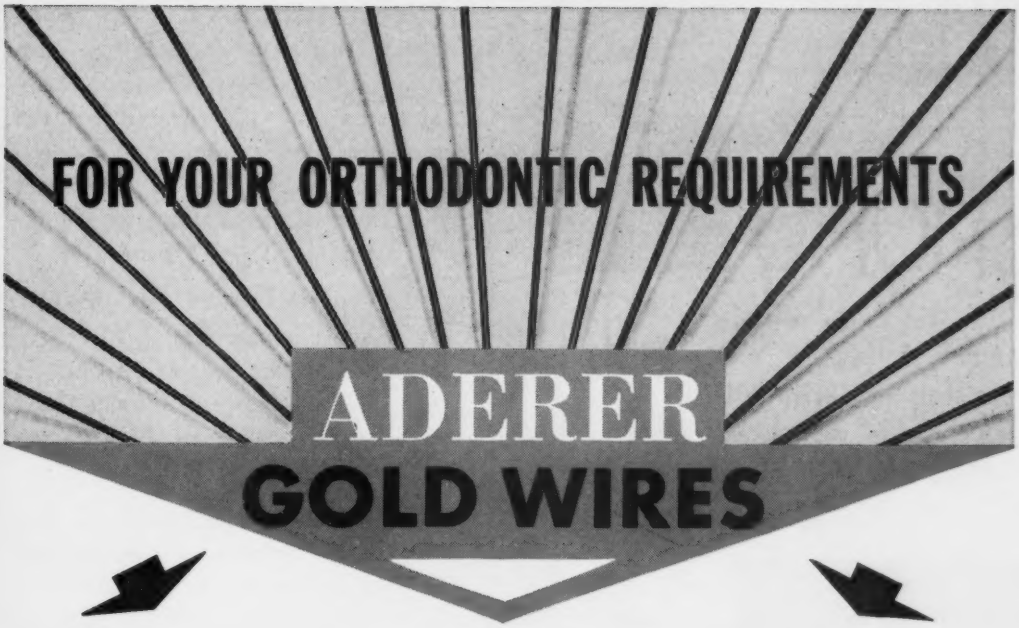
The pages are either missing or th

The filming is recorded as the boo

ncy at this point.

or the pagination is incorrect.

book is found in the collections.



ADERER NO. 4 WIRE:

This high-fusing platinum gold alloy provides great strength, elasticity and pliability. It is highly recommended for base wire, main and auxiliary wires such as finger springs — and for applications requiring a high degree of elasticity.

ADERER NO. 3 WIRE:

This is one of the finest wires available. It is an alloy of platinum and gold, well-adapted for orthodontic work. Despite its lower cost, it is high-fusing, has the same elastic qualities as No. 4 Wire but offers slightly less resistance to rupture.

ADERER NO. 1 WIRE:

A platinum-gold alloy wire used successfully for the same purposes as No. 4 Wire and with the same technique. Although its fusion temperature is somewhat lower than No. 4, it still may be used with any good grade of solder. The properties of No. 1 Wire are superior to many competitive higher-priced wires.

MULTI-ORTHO WIRE:

Here, low cost and low specific gravity provide advantageous economy in a high-fusing wire with exceptionally fine tempering qualities.

ADERER WIRES ARE AVAILABLE IN ALL GAUGES AND SHAPES—ROUND, HALF-ROUND, SQUARE AND RECTANGULAR

PHYSICAL PROPERTIES OF ADERER GOLD ORTHODONTIC WIRES

NAME	ULT. TENSILE STRENGTH	PROPORTIONAL LIMIT	FUSION TEMP. °F	ELONGATION IN 2"	YIELD PT. STRAIN	COOLING PERIOD MIN.	COLD BENDS
ADERER NO. 4 WIRE	114,500 Q 153,400 OC	74,400 117,600	1877	18 6.5	.00735	30	5.5 3.5
ADERER NO. 3 WIRE	108,300 Q 150,500 OC	62,600 107,500	1835	23 6.	.0076	30	5 2.5
ADERER NO. 1 WIRE	110,000 Q 173,500 OC	60,000 110,000	1762	19 5.5	.0069	30	5 2.5
MULTI-ORTHO WIRE	92,400 Q 130,400 OC	63,000 110,600	1710	18 3	over .0085	30	4 2.5

ADERER GOLDS
Julius Aderer, Inc., New York · Chicago

JULIUS ADERER, INC. • NEW YORK CITY • CHICAGO

● The Margolis Cephalostat, the X-ray Fixator and the Camera Mount are now being constructed and distributed by the College of Engineering in conjunction with the Cleft Palate Institute of the School of Dental Medicine of Tufts University.

● Information may be obtained by addressing inquiries to: Professor E. Leavitt, Department of Mechanical Engineering, Tufts University, Medford 55, Massachusetts.

● It should be emphasized that the construction and distribution of this equipment is strictly on a non-profit level on the part of Tufts University and those individuals associated with the University.

INDEX TO ADVERTISERS

Please mention "AMERICAN JOURNAL OF ORTHODONTICS" when writing to our Advertisers—It identifies you

AMERICAN JOURNAL OF ORTHODONTICS

Published by THE C. V. MOSBY COMPANY, 3207 Washington Blvd.
St. Louis 3, U. S. A.

Entered at the Post Office at St. Louis, Mo., as Second-class Matter

Published Monthly. Subscriptions may begin at any time.

Official Publication of The American Association of Orthodontists,
its component societies and The American Board of Orthodontics

EDITORIAL COMMUNICATIONS

Original Communications.—Manuscripts for publication and correspondence relating to them should be sent to Dr. H. C. Pollock, 8015 Maryland Ave., St. Louis 5, Mo., U. S. A.

Manuscripts should be typewritten on one side of the paper only, with double spacing and liberal margins. References should be placed at the end of the article and should include, in the order given, name of author, title, journal, volume, pages, and year; e.g., Smith, E. J.: Children's Dentistry, Am. J. Orthodontics, 34: 1-25, 1947. Illustrations accompanying manuscripts should be numbered, provided with suitable legends, and marked lightly on back with author's name. Articles accepted for publication are subject to editorial revision. Neither the editors nor the publishers accept responsibility for the views and statements of authors as published in their "Original Articles."

Illustrations.—A reasonable number of halftone illustrations will be reproduced free of cost to the author, but special arrangements must be made with the editor for color plates, elaborate tables or extra illustrations. Copy for zinc cuts (such as pen drawings and charts) should be drawn and lettered only in India ink, or black typewriter ribbon (when the typewriter is used). Only glossy photographic prints should be supplied for halftone work; original drawings, not photographs of them, should accompany the manuscript.

Books for Review.—Only such books as are considered of interest and value to subscribers will be reviewed, and no published acknowledgment of books received will be made. These should be sent to Dr. J. A. Salzmann, 654 Madison Ave., New York City.

Reprints.—Reprints of articles must be ordered directly through the publishers, The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, Mo., U. S. A., who will send their schedule of prices. Individual reprints of an article must be obtained through the author.

BUSINESS COMMUNICATIONS

Business Communications.—All communications in regard to advertising, subscriptions, change of address, etc., should be addressed to the publishers, The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, Mo.

Subscription Rates.—United States and its Possessions $10.00, Students $5.00; Canada, Latin-America, and Spain $10.50, Students $5.50; Other Countries $11.00, Students $6.00. Single copies, $1.75 postpaid. Remittances for subscriptions should be made by check, draft, post office or express money order, payable to this Journal.

Publication Order.—The monthly issues of this Journal form one volume a year; the index is in the December issue.

Change of Address Notice.—Six weeks' notice is required to effect a change of address. Kindly give the exact name under which a subscription is entered, and the full form of both old and new addresses, including the post office zone number.

Advertisements.—Only articles of known scientific value will be given space. Forms close first of month preceding date of issue. Advertising rates and page sizes on application.

Bound Volumes.—Publishers' Authorized Bindery Service, 5811 West Division Street, Chicago 51, Illinois, will quote prices for binding complete volumes in permanent buckram.